

Grizzly *Industrial, Inc.*®

MODEL G9036 13" x 40" GEAR-HEAD LATHE OWNER'S MANUAL



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#TR10672 PRINTED IN CHINA

WARNING!

This manual provides critical safety instructions on the proper setup, operation, maintenance and service of this machine/equipment.

Failure to read, understand and follow the instructions given in this manual may result in serious personal injury, including amputation, electrocution or death.

The owner of this machine/equipment is solely responsible for its safe use. This responsibility includes but is not limited to proper installation in a safe environment, personnel training and usage authorization, proper inspection and maintenance, manual availability and comprehension, application of safety devices, blade/cutter integrity, and the usage of personal protective equipment.

The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.

WARNING!

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- **Lead from lead-based paints.**
- **Crystalline silica from bricks, cement and other masonry products.**
- **Arsenic and chromium from chemically-treated lumber.**

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: Work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

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INTRODUCTION

Foreword

We are proud to offer the Model G9036. This machine is part of a growing Grizzly family of fine metalworking machinery. When used according to the guidelines set forth in this manual, you can expect years of trouble-free, enjoyable operation and proof of Grizzly's commitment to customer satisfaction.

The specifications, drawings, and photographs illustrated in this manual represent the Model G9036 when the manual was prepared. However, owing to Grizzly's policy of continuous improvement, changes may be made at any time with no obligation on the part of Grizzly. For your convenience, we always keep current Grizzly manuals available on our website at www.grizzly.com. Any updates to your machine will be reflected in these manuals as soon as they are complete. Visit our site often to check for the latest updates to this manual!

Contact Info

We stand behind our machines. If you have any service questions, parts requests or general questions about the machine, please call or write us at the location listed below.

Grizzly Industrial, Inc.
1203 Lycoming Mall Circle
Muncy, PA 17756
Phone: (570) 546-9663
Fax: (800) 438-5901
E-Mail: techsupport@grizzly.com

If you have any comments regarding this manual, please write to us at the address below:

Grizzly Industrial, Inc.
c/o Technical Documentation Manager
P.O. Box 2069
Bellingham, WA 98227-2069
Email: manuals@grizzly.com

Functional Overview

The primary purpose of the metal lathe is to make concentric cuts in metal stock. With the lathe, round stock can be made perfectly concentric, threaded, drilled, knurled, bored, tapered, etc. Square stock can be made into precision round shafts used for axles, spindles, leadscrews, punches, etc.

The maximum size of workpiece a lathe can cut is determined by the swing, which is the distance from the centerline of the spindle to the bed, and the throw, which is the maximum distance between the tailstock and the spindle. However, some lathes feature open spindles that allow longer workpieces to extend through the headstock.

During typical operations, the lathe cuts with a fixed cutting tool that is positioned against a rotating workpiece. To rotate a workpiece, the operator centers it on a clamping device called a chuck or faceplate, then securely clamps it to the spindle so it will not fly loose during operation.

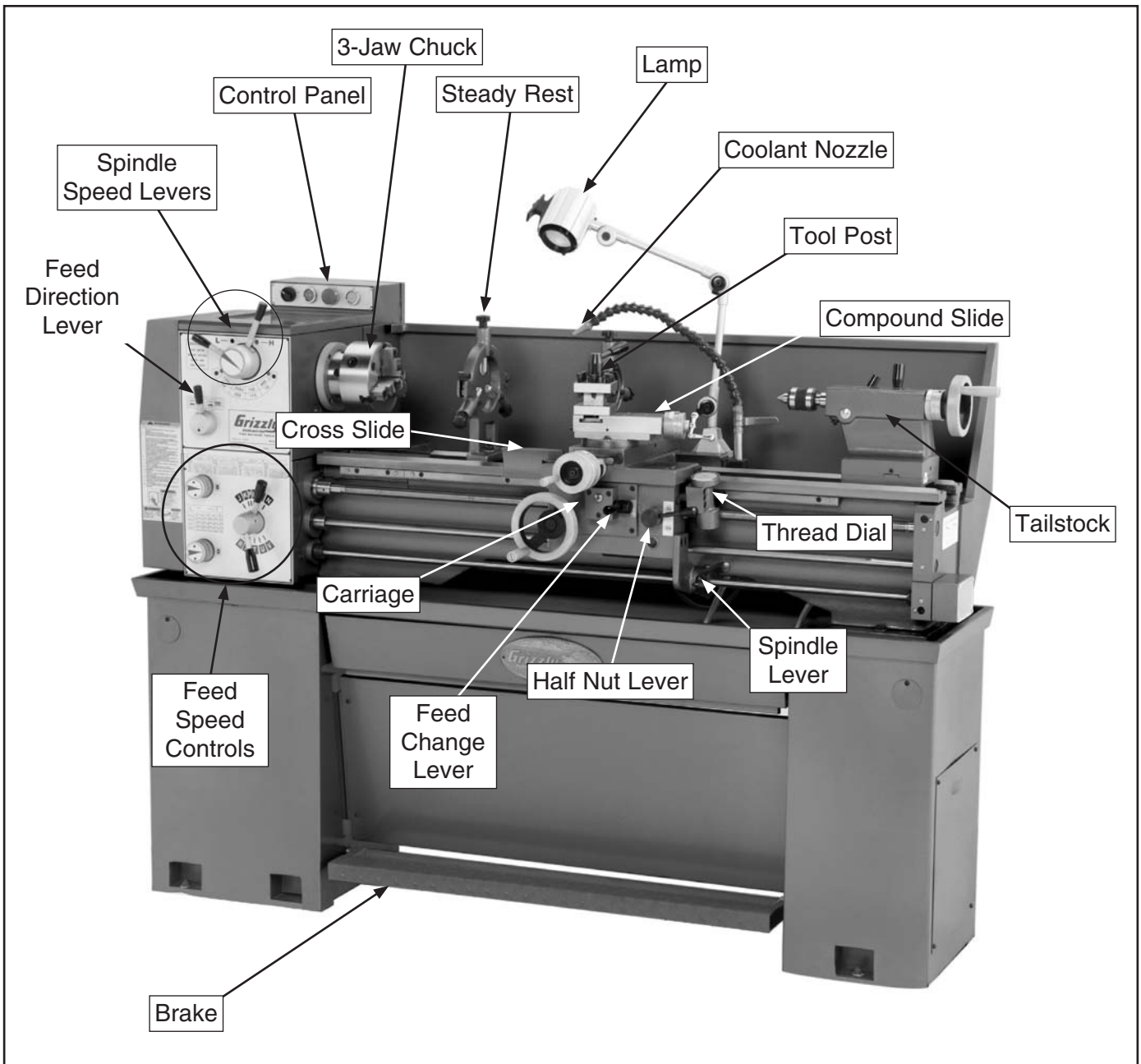
The spindle connects to the motor through a series of gears and pulleys that control the allowable speed the spindle can rotate, which allows the operator different options for cutting based on the type of metal and size of workpiece.

The cutting tool is mounted on a tool post, which is positioned by three different bases that move linearly in their own designated direction. The bottom base is the carriage, which moves left and right, and is equipped with a power feed system for automated cutting and threading operations. The middle base is the cross slide, which moves in and out. The top base is the compound slide, which moves diagonally.

The lathe is also outfitted with a support device called a tailstock. The tailstock is mounted on the lathe bed opposite of the spindle, and it moves toward or away from the spindle and can be locked against the bed to firmly support the end of a workpiece that is not attached to the spindle.



Identification





MACHINE DATA SHEET

Customer Service #: (570) 546-9663 · To Order Call: (800) 523-4777 · Fax #: (800) 438-5901

MODEL G9036 13" X 40" GEAR-HEAD FLOOR LATHE

Product Dimensions:

Weight..... 1320 lbs.
 Length/Width/Height..... 71-1/2 x 30 x 53-1/2 in.
 Foot Print (Length/Width)..... 69-1/2 x 15-3/4 in.

Shipping Dimensions:

Type..... Wood Crate
 Content..... Machine
 Weight..... 1555 lbs.
 Length/Width/Height..... 76 x 30 x 60 in.

Electrical:

Switch..... Magnetic Switch with Thermal Overload Protection
 Switch Voltage..... 220V
 Recommended Breaker Size..... 15 amp
 Plug..... No

Motors:

Main

Type..... TEFC Capacitor Start Induction
 Horsepower..... 2 HP
 Voltage..... 220V
 Prewired..... 220V
 Phase..... Single
 Amps..... 10A
 Speed..... 1725 RPM
 Cycle..... 60 Hz
 Number Of Speeds..... 1
 Power Transfer Belt Drive to Gear
 Bearings..... Shielded and Permanently Lubricated

Main Specifications:

Operation Info

Swing Over Bed..... 13 in.
 Dist Between Centers..... 40 in.
 Swing Over Cross Slide..... 7-3/4 in.
 Swing Over Saddle..... 7-3/4 in.
 Swing Over Gap..... 18-3/4 in.
 Max Tool Bit Size..... 5/8 in.
 Compound Travel..... 2-7/8 in.
 Carriage Travel..... 35 in.
 Cross Slide Travel..... 6-1/8 in.



Headstock Info

Spindle Bore..... 1-7/16 in.
Spindle Taper..... MT#5
No Of Spindle Speeds..... 8
Range Of Spindle Speeds..... 70, 115, 190, 300, 460, 755, 1255, 2000 RPM
Spindle Type..... D1-4 Camlock
Spindle Bearings..... Tapered Roller

Tailstock Info

Tailstock Travel..... 3-3/8 in.
Tailstock Taper..... MT#3
Tailstock Barrel Diameter..... 1-1/4 in.

Threading Info

No Of Inch Threads..... 32
Range Of Inch Threads..... 3-1/2 - 80 TPI
Range Of Longitudinal Feeds..... 0.0009 - 0.040 in.
No Of Longitudinal Feeds..... 20
No Of Cross Feeds..... 20
Range Of Cross Feeds..... 0.0009 - 0.0138 in./rev.
No Of Metric Threads..... 29
Range Of Metric Threads..... 0.45 - 7 mm

Dimensions

Bed Width..... 7-3/8 in.
Leadscrew TPI..... 8
Leadscrew Length..... 52 in.
Faceplate Size..... 12 in.
Leadscrew Diameter..... 7/8 in.
Feed Rod Diameter..... 3/4 in.
Floor To Center Height..... 46-1/2 in.

Construction

Base Construction..... Cast Iron
Headstock Construction..... Cast Iron
Headstock Gears Construction..... Flame Hardened Steel
Bed Construction..... Induction Hardened Cast Iron
Body Construction..... Cast Iron
Stand Construction..... Cast Iron
Paint..... Epoxy

Other

Kilowatt Output..... 1.5

Other Specifications:

Country Of Origin China
Warranty 1 Year
Serial Number Location Front Lower Right of Headstock and Between Bed Ways Tailstock Side



Features:

- Built-in Stand
- Carriage Mounted On/Off Control Lever
- Coolant System
- Foot Brake
- Front Removable Chip Tray
- Full Length Splash Guard
- Halogen Light
- Jog Button and Emergency Stop
- Removable Chip Pan
- Threading Dial

Accessories Included:

- 12" Face Plate
- 4 Way Turret Tool Post
- 6" 3-Jaw Chuck with Reversible Top Jaws
- 8" 4-Jaw Chuck with Reversible Jaws
- Carbide Tipped MT#3 Dead Center
- Follow Rest
- MT#3 Dead Center
- Oil Can
- Set of 8 Change Gears
- Steady Rest
- Tool Box



SECTION 1: SAFETY

WARNING

For Your Own Safety, Read Instruction Manual Before Operating this Machine

The purpose of safety symbols is to attract your attention to possible hazardous conditions. This manual uses a series of symbols and signal words intended to convey the level of importance of the safety messages. The progression of symbols is described below. Remember that safety messages by themselves do not eliminate danger and are not a substitute for proper accident prevention measures.

 **DANGER** Indicates an imminently hazardous situation which, if not avoided, **WILL** result in death or serious injury.

 **WARNING** Indicates a potentially hazardous situation which, if not avoided, **COULD** result in death or serious injury.

 **CAUTION** Indicates a potentially hazardous situation which, if not avoided, **MAY** result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTICE This symbol is used to alert the user to useful information about proper operation of the machine.

WARNING

Safety Instructions for Machinery

- 1. READ THE ENTIRE MANUAL BEFORE STARTING MACHINERY.** Machinery presents serious injury hazards to untrained users.
- 2. ALWAYS USE ANSI APPROVED SAFETY GLASSES WHEN OPERATING MACHINERY.** Everyday eyeglasses only have impact resistant lenses—they are NOT safety glasses.
- 3. ALWAYS WEAR A NIOSH APPROVED RESPIRATOR WHEN OPERATING MACHINERY THAT PRODUCES DUST.** Most types of dust (wood, metal, etc.) can cause severe respiratory illnesses.
- 4. ALWAYS USE HEARING PROTECTION WHEN OPERATING MACHINERY.** Machinery noise can cause permanent hearing loss.
- 5. WEAR PROPER APPAREL. DO NOT** wear loose clothing, gloves, neckties, rings, or jewelry that can catch in moving parts. Wear protective hair covering to contain long hair and wear non-slip footwear.
- 6. NEVER OPERATE MACHINERY WHEN TIRED OR UNDER THE INFLUENCE OF DRUGS OR ALCOHOL.** Be mentally alert at all times when running machinery.



WARNING

Safety Instructions for Machinery

7. **ONLY ALLOW TRAINED AND PROPERLY SUPERVISED PERSONNEL TO OPERATE MACHINERY.** Make sure operation instructions are safe and clearly understood.
8. **KEEP CHILDREN AND VISITORS AWAY.** Keep all children and visitors a safe distance from the work area.
9. **MAKE WORKSHOP CHILDPROOF.** Use padlocks, master switches, and remove start switch keys.
10. **NEVER LEAVE WHEN MACHINE IS RUNNING.** Turn power **OFF** and allow all moving parts to come to a complete stop before leaving machine unattended.
11. **DO NOT USE IN DANGEROUS ENVIRONMENTS.** DO NOT use machinery in damp, wet locations, or where any flammable or noxious fumes may exist.
12. **KEEP WORK AREA CLEAN AND WELL LIGHTED.** Clutter and dark shadows may cause accidents.
13. **USE A GROUNDED EXTENSION CORD RATED FOR THE MACHINE AMPERAGE.** Grounded cords minimize shock hazards. Undersized cords create excessive heat. Always replace damaged extension cords.
14. **ALWAYS DISCONNECT FROM POWER SOURCE BEFORE SERVICING MACHINERY.** Make sure switch is in OFF position before reconnecting.
15. **MAINTAIN MACHINERY WITH CARE.** Keep blades sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.
16. **MAKE SURE GUARDS ARE IN PLACE AND WORK CORRECTLY BEFORE USING MACHINERY.**
17. **REMOVE ADJUSTING KEYS AND WRENCHES.** Make a habit of checking for keys and adjusting wrenches before turning machinery **ON**.
18. **CHECK FOR DAMAGED PARTS BEFORE USING MACHINERY.** Check for binding or misaligned parts, broken parts, loose bolts, and any other conditions that may impair machine operation. Repair or replace damaged parts before operation.
19. **USE RECOMMENDED ACCESSORIES.** Refer to the instruction manual for recommended accessories. Improper accessories increase risk of injury.
20. **DO NOT FORCE MACHINERY.** Work at the speed for which the machine or accessory was designed.
21. **SECURE WORKPIECE.** Use clamps or a vise to hold the workpiece when practical. A secured workpiece protects your hands and frees both hands to operate the machine.
22. **DO NOT OVERREACH.** Maintain stability and balance at all times.
23. **MANY MACHINES CAN EJECT WORKPIECES TOWARD OPERATOR.** Know and avoid conditions that cause the workpiece to "kickback."
24. **ALWAYS LOCK MOBILE BASES (IF USED) BEFORE OPERATING MACHINERY.**
25. **CERTAIN DUST MAY BE HAZARDOUS** to the respiratory systems of people and animals, especially fine dust. Be aware of the type of dust you are exposed to and always wear a respirator designed to filter that type of dust.



WARNING

Additional Safety Instructions for Lathes

- 1. UNDERSTANDING THE MACHINE:** Read and understand this manual before operating machine.
- 2. CLEANING MACHINE:** To avoid lacerations, do not clear chips by hand. Use a brush, and never clear chips while the lathe is operating.
- 3. USING CORRECT TOOLING:** Always select the right cutter for the job, and make sure cutters are sharp. The right tool decreases strain on the lathe components and reduces the risk of unsafe cutting.
- 4. ELIMINATING A PROJECTILE HAZARD:** Always remove the chuck key after use, and never walk away from the lathe with the chuck key installed.
- 5. SECURING A WORKPIECE:** Make sure workpiece is properly held in the chuck before starting lathe. A workpiece thrown from the chuck could cause severe injury.
- 6. AVOIDING OVERLOADS:** Always use the appropriate feed and speed rates.
- 7. MAINTAINING A SAFE WORKPLACE:** Never leave lathe unattended while it is running.
- 8. PREVENTING A CUTTING TOOL/CHUCK CRASH:** Always release automatic feeds after completing a job.
- 9. AVOIDING STARTUP INJURIES:** Make sure workpiece, cutting tool, and tool post have adequate clearance before starting lathe. Check chuck clearance and saddle clearance before starting the lathe. Make sure spindle RPM is set correctly for part diameter before starting the lathe. Large parts can be ejected from the chuck if the chuck speed is set too high.
- 10. CHUCK SAFETY:** Chucks are surprisingly heavy and awkward to hold, so protect your hands and the lathe ways. Always use a chuck cradle or piece of plywood over the lathe ways.
- 11. WORKPIECE SUPPORT:** Support a long workpiece if it extends from the headstock so it will not wobble violently when the lathe is turned **ON**. If workpiece extends more than 2.5 times its diameter from the chuck, support it by a center or steady rest, or it may deflect and fall out of the chuck while cutting.
- 12. AVOIDING ENTANGLEMENT INJURIES:** Never attempt to slow or stop the lathe chuck or mill spindle by hand; and tie back long hair, ponytails, loose clothing, and sleeves so they do not dangle.

WARNING

Like all machinery there is potential danger when operating this machine. Accidents are frequently caused by lack of familiarity or failure to pay attention. Use this machine with respect and caution to lessen the possibility of operator injury. If normal safety precautions are overlooked or ignored, serious personal injury may occur.

CAUTION

No list of safety guidelines can be complete. Every shop environment is different. Always consider safety first, as it applies to your individual working conditions. Use this and other machinery with caution and respect. Failure to do so could result in serious personal injury, damage to equipment, or poor work results.



Glossary of Terms

The following is a list of common definitions, terms and phrases used throughout this manual as they relate to this lathe and metalworking in general. Become familiar with these terms for assembling, adjusting or operating this machine. Your safety is **VERY** important to us at Grizzly!

Arbor: A machine shaft that supports a cutting tool.

Backlash: Wear in a screw or gear mechanism that may result in slippage, vibration, and loss of tolerance.

Carriage: A main housing that consists of the apron and the saddle.

Cross Slide: A fixture attached to the lathe carriage that holds the compound rest and can be moved in and out.

Compound Rest: A fixture attached to the cross slide that holds the tool holder and can be moved in and out.

Cutting Speed: The distance that a point on a cutter moves in one minute, expressed in meters or feet per minute.

Dial Indicator: An instrument used in setup and inspection work that shows on a dial the amount of error in size or alignment of a part.

Facing: In lathe work, cutting across the end of a workpiece, usually to machine a flat surface.

Feed: The movement of a cutting tool into a workpiece.

Gib: A tapered wedge located along a sliding member to take up wear or to ensure a proper fit.

Headstock: The major lathe component that houses the spindle and motor drive system to turn the workpiece.

Lathe Center: A lathe accessory with a 60° point which is inserted into the headstock or tailstock of the lathe and is used to support the workpiece.

Leadscrew: The long screw that is driven by the end gears and supplies power to the carriage.

Saddle: The upper portion of carriage that rides on the lathe ways and supports the cross feed and the follow rest.

Spindle: The revolving shaft that holds and drives the workpiece.

Tailstock: A moveable fixture opposite of the headstock on a lathe that has a spindle used to support one end of a workpiece and for holding tools.

Tool Post: The part of the compound rest that holds the tool holder.

Turret: A machine fixture that holds multiple tools and can be revolved and indexed to position.

Ways: The precision machined and flat tracks on which the carriage and tailstock slide.



SECTION 2: CIRCUIT REQUIREMENTS

220V Operation

!WARNING

Serious personal injury could occur if you connect the machine to power before completing the setup process. **DO NOT** connect the machine to the power until instructed later in this manual.



!WARNING

Electrocution or fire could result if machine is not grounded and installed in compliance with electrical codes. Compliance **MUST** be verified by a qualified electrician!

Full Load Amperage Draw

This machine draws the following amps under maximum load:

Amp Draw..... 10 Amps

Power Supply Circuit Requirements

You **MUST** connect your machine to a grounded circuit that is rated for the amperage given below. Never replace a circuit breaker on an existing circuit with one of higher amperage without consulting a qualified electrician to ensure compliance with wiring codes. **If you are unsure about the wiring codes in your area or you plan to connect your machine to a shared circuit, consult a qualified electrician.**

Minimum Circuit Size..... 15 Amps

Minimum Power Cord Requirements

For 220V connection, use a stranded-copper flexible cord that meets the minimum specifications listed below, does not exceed 50 ft., and has an insulation type that starts with "S." A qualified electrician **MUST** determine the best cord to use in your environment depending on exposure to moisture, heat, and oils.

Specifications 14/3 AWG, 300VAC

Power Connection Device

The type of plug required to connect your machine to power depends on the type of service you currently have or plan to install. We recommend using the plug shown in **Figure 1**.

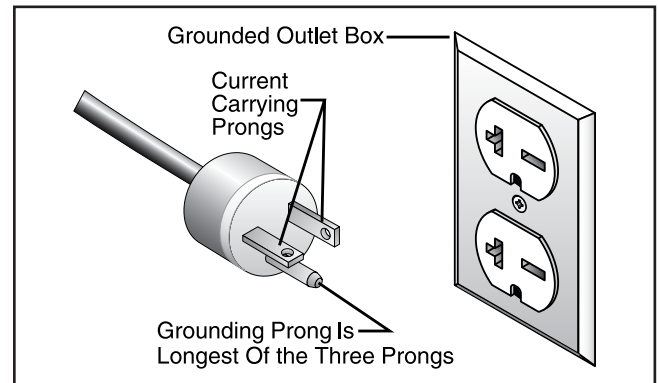


Figure 1. NEMA 6-15 plug and receptacle.

Extension Cords

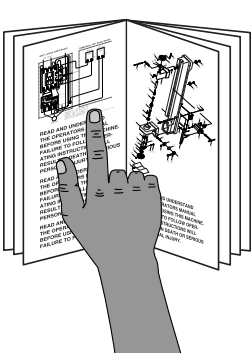
Using extension cords may reduce the life of the motor. Instead, place the machine near a power source. If you must use an extension cord:

- Use at least a 14 gauge cord that does not exceed 50 feet in length!
- The extension cord must also have a ground wire and plug pin.
- A qualified electrician **MUST** size cords over 50 feet long to prevent motor damage.



SECTION 3: SETUP

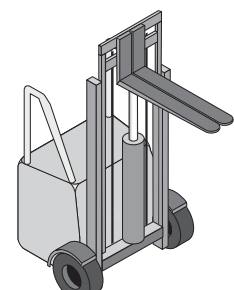
Setup Safety



!WARNING
This machine presents serious injury hazards to untrained users. Read through this entire manual to become familiar with the controls and operations before starting the machine!



!WARNING
Wear safety glasses during the entire set up process!



!WARNING
This machine and its components are very heavy. Use power lifting equipment such as a fork lift or hoist to move heavy items.

Items Needed for Setup

The following items are needed to complete the setup process, but are not included with your machine:

Description	Qty
• Fork Lift or Hoist (Rated 2000 lbs.)	1
• Lifting Straps (Rated 2000 lbs.).....	1
• Lifting Hooks (Rated 2000 lbs.).....	1
• Machinist's Level	1
• Degreaser/Solvent Cleaner	as needed
• Shop Rags for Cleaning	as needed
• Stiff Brush for Cleaning	1

Unpacking

Your machine was carefully packaged for safe transportation. Disassemble the crate and remove the packaging materials from around your machine to inspect it. If you discover the machine is damaged, *please immediately call Customer Service at (570) 546-9663 for advice.*

Save the containers and all packing materials for possible inspection by the carrier or its agent. *Otherwise, filing a freight claim can be difficult.*

When you are completely satisfied with the condition of your shipment, inventory the contents.



Inventory

After all the parts have been removed from the boxes, the following items should be included with your machine:

Mounted Inventory Components		Qty
A.	Three-Jaw Chuck	1
B.	Steady Rest.....	1
C.	Follow Rest.....	1
D.	Change Gears 32T, 85T, 100T	1 each

Loose Inventory Components		Qty
E.	Faceplate w/Driveplate	1
F.	Four-Jaw Chuck Kit	1
G.	Toolbox	1
H.	Spare Gear.....	1
I.	Spare Worm	1

Toolbox Inventory Components		Qty
J.	Change Gears 35T, 42T (x2), 44T, 46T, 48T, 52T, 55T, 120/127T	1 each
K.	Cam Lock Key	1
L.	Chuck Key	1
M.	Tool Post Wrench	1
N.	Live Center MT#3	1
O.	Spindle Sleeve MT#5/MT#3	1
P.	Oil Can	1
Q.	Dead Center MT#3 Carbide Tip	1
R.	Dead Center MT#3 HSS Tip	1
S.	Phillips Screwdriver 3"	1
T.	Flat Head Screwdriver 3".....	1
U.	Handles	2
V.	Hex Wrenches 2.5, 3, 4, 5, 6, 8mm ..	1 each
W.	Open-End Wrenches 9/11, 10/12, 12/14, 17/19mm.....	1 each
X.	Extra Shear Pins	2

NOTICE

Some hardware/fasteners on the inventory list may arrive pre-installed on the machine. Check these locations before assuming that any items from the inventory list are missing.

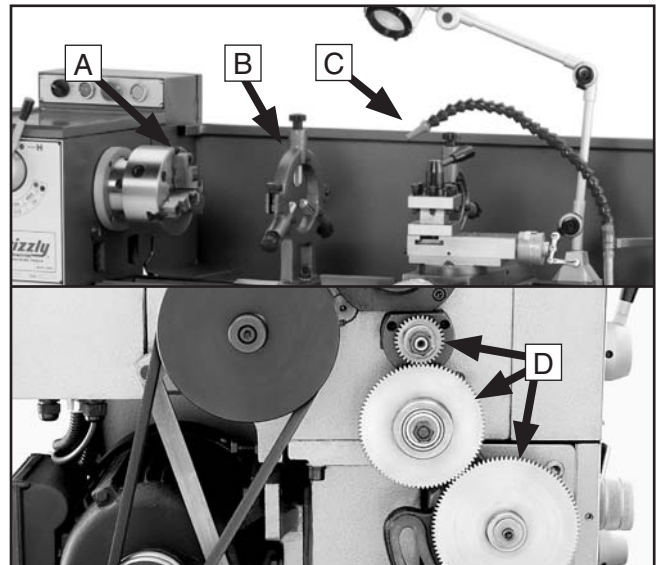


Figure 2. Mounted inventory components.

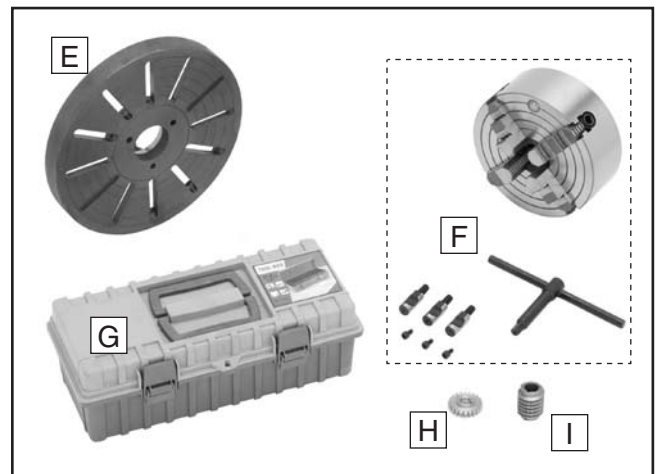


Figure 3. Loose inventory components.

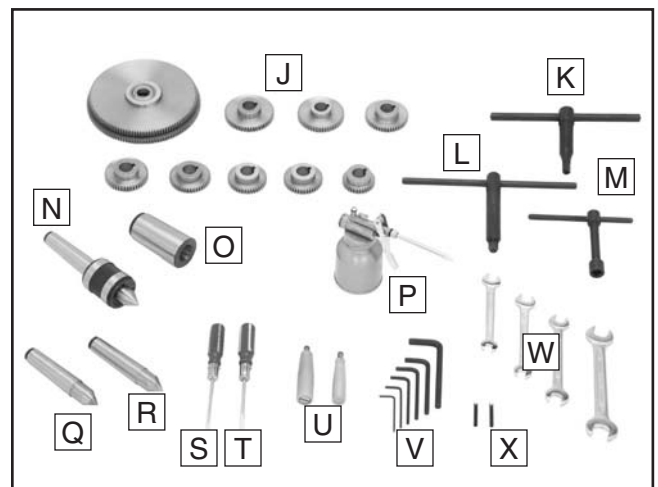
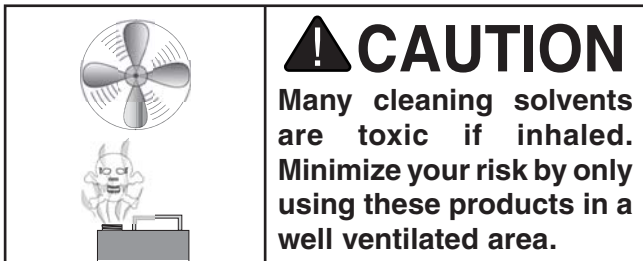
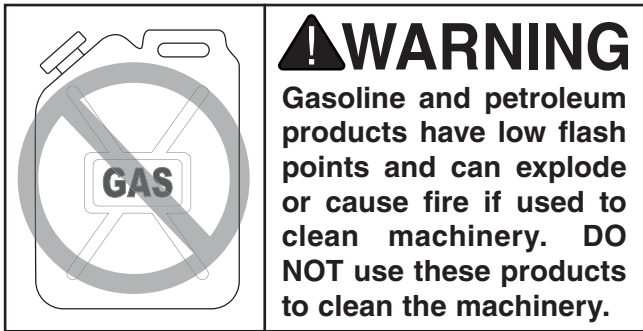


Figure 4. Toolbox inventory.



Clean Up



The unpainted surfaces are coated with a waxy grease to prevent corrosion during shipment. Cleaning this coating is an important part of setting up your lathe, because the protective coating can hinder performance of sliding parts if not removed. Plan to set aside 2–3 hours to thoroughly clean your lathe and its components. This time will be well spent when you are rewarded with smooth action of the sliding components.

The protective coating on your lathe can be removed with a solvent cleaner or degreaser, such as shown in **Figure 5**, or any common penetrating lubricant.

After cleaning, wipe down the components with a generous coat of way oil, such as shown in **Figure 6**, to prevent rust and ease the friction of sliding components.

Cleaning Tips

- For thorough cleaning, remove the steady rest, tool post, compound slide, and change-gears.
- Use a stiff brush when cleaning the threads on the leadscrew.
- Move the slides and tailstock back and forth to thoroughly clean/lubricate underneath them.

G2544—Solvent Cleaner & Degreaser

A great product for removing the waxy shipping grease from your machine during clean up.



Figure 5. Cleaner/degreaser available from Grizzly.

H8257—Primrose Armor Plate with Moly-D Machine and Way Oil 1 Quart

This superior machine and way lubricant prevents stick slip and chatter due to anti-friction capabilities resulting in greater precision machining capabilities. Provides the thinnest oil film possible while effectively providing needed lubrication and rust/corrosion protection. Adhesive/cohesive components are added for vertical surfaces. Resists squeeze out, running, dripping and non-gumming.

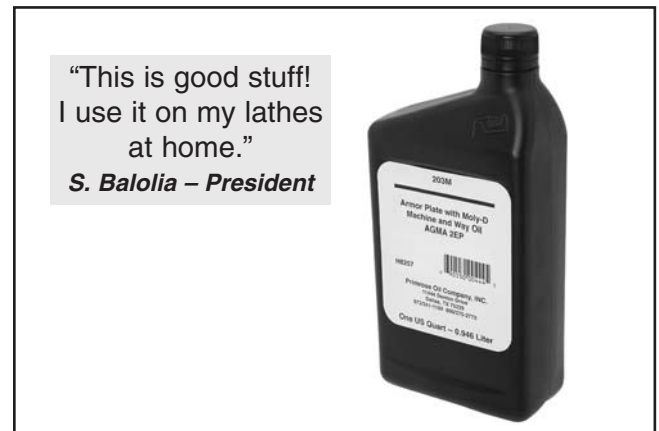


Figure 6. Primrose Armor Plate Lubricant.



Site Considerations

Floor Load

Your lathe is a heavy load distributed in a small footprint. Place this machine on concrete floors only. Since this is a precision machine, it is important to level the machine with a precision level when mounting.

Placement Location

Consider existing and anticipated needs, service panel access, length of rods to be loaded into the lathe, and space for auxiliary stands, work tables or other machinery when establishing a location for your lathe (see **Figure 7** for minimum wall clearances).

	<p>! CAUTION</p> <p>Children and visitors may be seriously injured if unsupervised. Lock all entrances to the shop when you are away. DO NOT allow unsupervised children or visitors in your shop at any time!</p>
------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

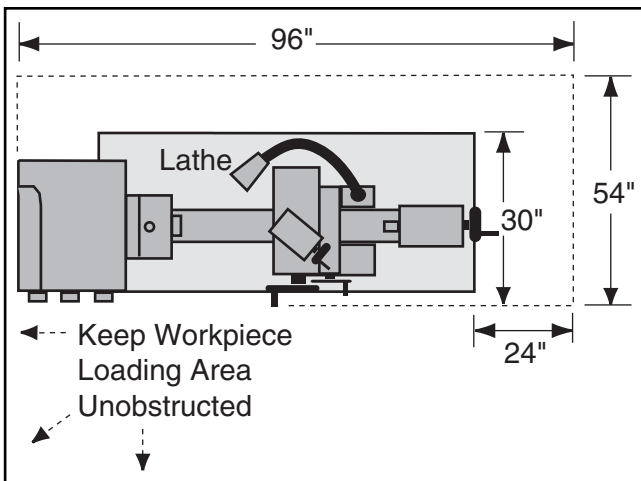
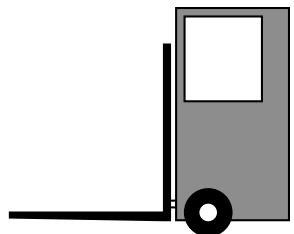


Figure 7. Minimum wall clearances.

Lifting & Moving

<p>! WARNING</p> 
<p>You will need power lifting equipment and assistance to lift this machine and position it. Inspect all lifting equipment to make sure it is in perfect working order and is rated for the load before attempting to lift and move this lathe. Ignoring this warning may lead to serious personal injury or death.</p>

This lathe has lifting holes built into the stand (**Figure 8**). These lifting holes are designed to allow a piece of sturdy round stock to be slid through each of them, so that a forklift can lift the lathe from the pieces of round stock.

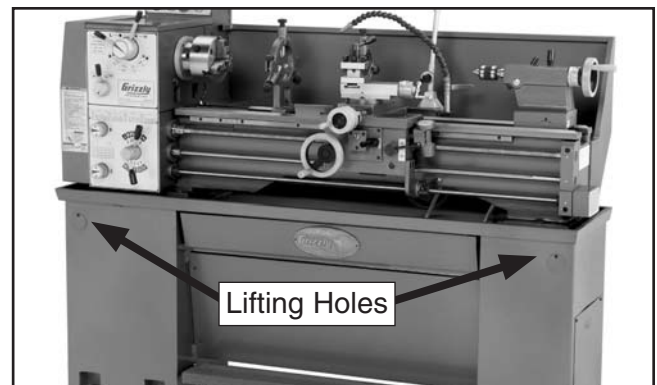


Figure 8. Lifting holes.



Mounting Lathe

In order to produce accurate work, the lathe must sit level on the floor. Below are the most common methods for mounting the lathe.

Machine Mounts

The lathe can be mounted on machine mounts, which can be easily leveled by turning fine thread hex nuts. Additionally, the large rubber foot pads on the machine mounts reduce vibration.



Figure 9. G7160 Machine Mount.

Concrete Floor Mounting Options

If you fasten the lathe to a concrete floor, you must shim it level before tightening the fasteners, or the beds may twist out of alignment.

Lag shield anchors with lag bolts (Figure 10) and anchor studs (Figure 11) are two popular methods for anchoring an object to a concrete floor.

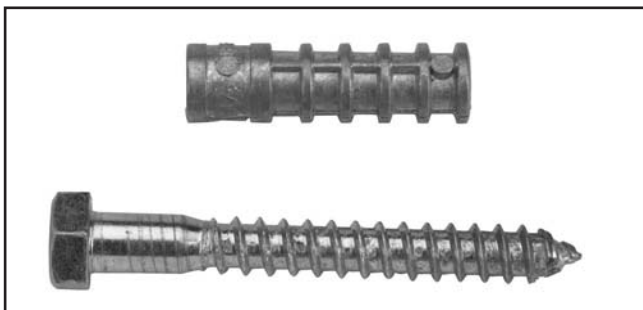


Figure 10. Typical lag shield anchor and lag bolt.

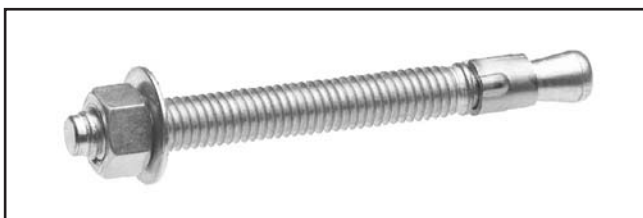


Figure 11. Typical anchor stud.

Check Gearbox Oil

It is critical that you make sure there is oil in the headstock and apron gearboxes before proceeding with the test run. Refer to the **Lubrication** instructions on **Page 44** for more details on which type of oil to use, how much to use, and where to put it.



Test Run

Once the assembly is complete, test run your machine to make sure it runs properly and is ready for regular operation. The test run consists of verifying the following: 1) The motor powers up and runs correctly and 2) the stop button safety feature works correctly.

If, during the test run, you cannot easily locate the source of an unusual noise or vibration, stop using the machine immediately, then review **Troubleshooting** on **Page 47**.

If you cannot find a remedy, contact our Tech Support at (570) 546-9663 for assistance.

To begin the test run:

1. Make sure you understand the safety instructions at the beginning of the manual and that the machine is setup properly.
2. Make sure the lathe is lubricated and the headstock oil level is full. Refer to **Maintenance** on **Page 42**.
3. Make sure the chuck is correctly secured to the spindle. Refer to **Mounting Chuck and Faceplate** on **Page 22** for details.



4. Make sure all tools and objects used during setup are cleared away from the machine.
5. Disengage the half nut lever and the feed lever (**Figure 12**), and make sure the saddle lock bolt is loosened (do not loosen the saddle lock bolt too much—see **Page 51**).

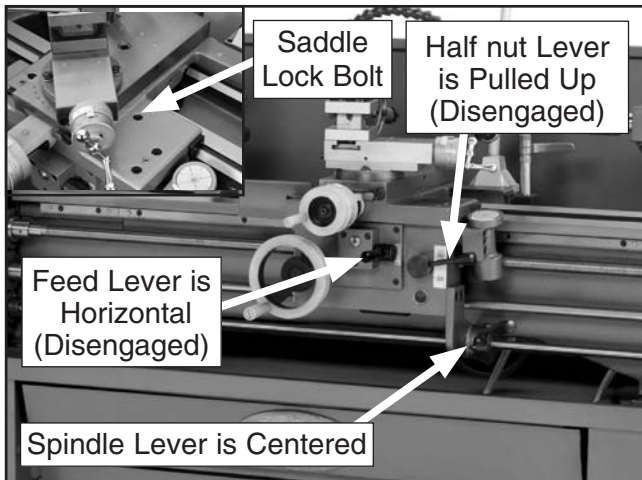


Figure 12. Apron controls.

NOTICE

NEVER shift lathe gears when lathe is operating, and make sure both the half nut lever and the feed lever are disengaged before you start the lathe! Otherwise the lathe may feed the apron into the chuck or tailstock and cause severe lathe damage.

6. Connect power to the machine.

! WARNING

Before starting the saw, make sure you have performed any preceding assembly and adjustment instructions, and you have read through the rest of the manual and are familiar with the various functions and safety features on this machine. Failure to follow this warning could result in serious personal injury or even death!

7. Rotate the red stop button (**Figure 13**) clockwise so it pops out.

8. Move the spindle speed levers to 70 RPM (**Figure 13**).



Figure 13. Headstock controls.

9. Push the POWER START button, then move the spindle lever (**Figure 12**) down to start the spindle.

—When operating correctly, the machine runs smoothly with little or no vibration or rubbing noises.

—Investigate and correct strange or unusual noises or vibrations before operating the machine further. Always disconnect the machine from power when investigating or correcting potential problems. If the problem is not readily apparent, refer to **Troubleshooting** on **Page 47**.

10. Move the spindle lever up to the center position, and press the stop button in.
11. WITHOUT resetting the stop button, move the spindle lever down. The machine should not start.

—If the machine does not start, the stop button safety feature is working correctly.

—If the machine does start (with the stop button pushed in), immediately disconnect power to the machine. The stop button safety feature is not working correctly. This safety feature must work properly before proceeding with regular operations. Call Tech Support for help.



12. Reset the stop button.
13. Make sure the lamp works.
14. *If you do not have cutting fluid at this time, skip this step.* Pour cutting fluid into the coolant tank (refer to **Page 46** for instructions) and turn the coolant pump switch **ON** and open the nozzle valve. Verify that cutting fluid flows out of the nozzle, then turn the coolant switch **OFF**.
15. Start the spindle then step on the brake. The spindle should come to an immediate stop.
8. Push down on the spindle lever to start spindle rotation counterclockwise. Let the lathe run for a minimum of 10 minutes.
9. Stop the spindle and disconnect the machine from power.
10. Repeat **Steps 5–9** for each of the spindle speeds.
11. Turn the lathe **OFF**. The spindle break-in is complete and your lathe is ready for operation.

Spindle Break-In

NOTICE

Successfully complete all of the spindle break-in steps to avoid rapid deterioration of the spindle bearings and other related parts.

To correctly break-in the spindle bearings:

1. DISCONNECT LATHE FROM POWER!
2. Make sure the lathe is properly lubricated (refer to **Maintenance** on **Page 42** for detailed instructions).
3. Set spindle speed to the lowest setting (70 RPM; refer to **Spindle Speed** on **Page 33** for detailed instructions).
4. Disengage the power feed by moving the feed rod selection lever to the neutral (center) position (refer to **Basic Controls** on **Page 19**).
5. Re-connect the machine to power.
6. Pull up on the spindle lever to start spindle rotation clockwise. Let the lathe run for a minimum of 10 minutes.
7. Stop the spindle rotation and allow the spindle to come to a complete stop.

Recommended Adjustments

For your convenience, the adjustments listed below have been performed at the factory.

However, because of the many variables involved with shipping, we recommend that you at least verify the following adjustments to ensure the best possible results from your new machine.

Step-by-step instructions for these adjustments can be found in the **SERVICE** section starting on **Page 47**.

Factory adjustments that should be verified:

- **Gib Adjustments (Page 50)**
- **Tailstock Alignment (Page 29)**
- **Backlash Adjustments (Page 49)**

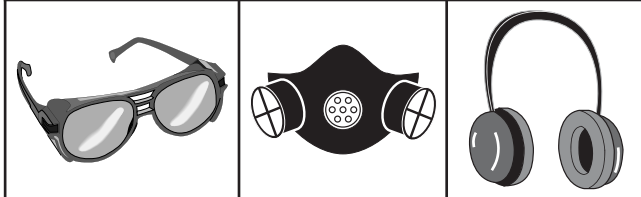


SECTION 4: OPERATION

Operation Safety

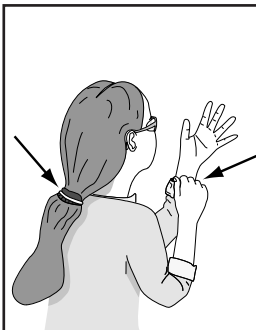
!WARNING

Damage to your eyes, lungs, and ears could result from using this machine without proper protective gear. Always wear safety glasses, a respirator, and hearing protection when operating this machine.



!WARNING

Loose hair and clothing could get caught in machinery and cause serious personal injury. Keep loose clothing and long hair away from moving machinery.



NOTICE

If you have never used this type of machine or equipment before, **WE STRONGLY RECOMMEND** that you read books, trade magazines, or get formal training before beginning any projects. Regardless of the content in this section, Grizzly Industrial will not be held liable for accidents caused by lack of training.

NOTICE

Complete the Test Run & Break-In procedure on Page 16 before using this lathe for any cutting or threading operations; otherwise, gear box damage will occur.

Basic Controls

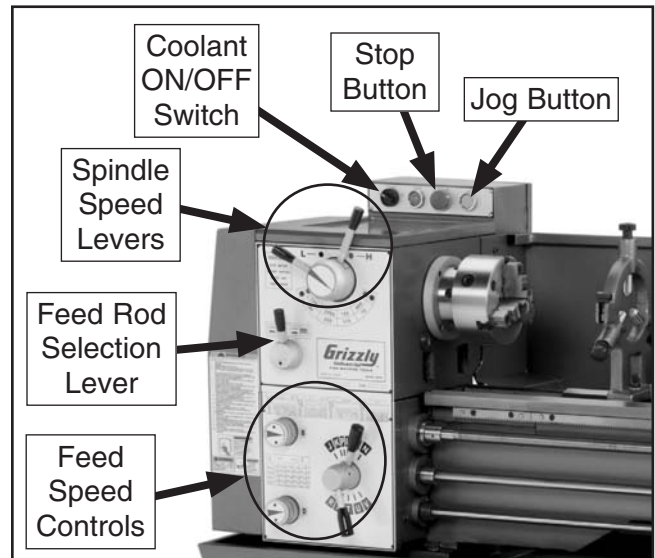


Figure 14. Headstock controls.

Jog Button

The jog button (Figure 14) powers up the spindle and leadscrew (if engaged) only while held. This button only works if the stop button has been reset and the brake pedal is not depressed.

Stop Button

The stop button (Figure 14) cuts power to the motor to stop the lathe. It does not instantly stop the spindle as does the brake. After being pressed, this button stays down until it is reset. Reset the button by twisting it clockwise until it pops out.

Coolant ON/OFF Switch

The coolant ON/OFF switch (Figure 14) toggles the coolant pump **ON** or **OFF**. Never turn the coolant pump on when coolant is not in the reservoir or the pump may burn up. **This is considered abuse and will not be covered under warranty.**



Spindle Speed Levers

The spindle speed levers (**Figure 14**) control the speed that the spindle rotates. The chart below the levers indicates the different lever configurations required to make the spindle rotate at various speeds. **Never move this lever while the spindle is moving.**

Feed Direction Lever

The feed direction lever (**Figure 14**) controls which direction the feed rod rotates when the spindle lever is used. This allows you to change feed directions without changing the direction of spindle rotation. **Never move this lever while the spindle is moving.** Refer to **Page 35** for details of how to use this lever for operations.

Feed Speed Controls

These knobs and levers (**Figure 14**) control feed speeds and leadscrew engagement for threading and turning.



Figure 15. Brake.

Brake

The brake (**Figure 15**) physically stops the spindle and cuts power to the motor when pressed down.

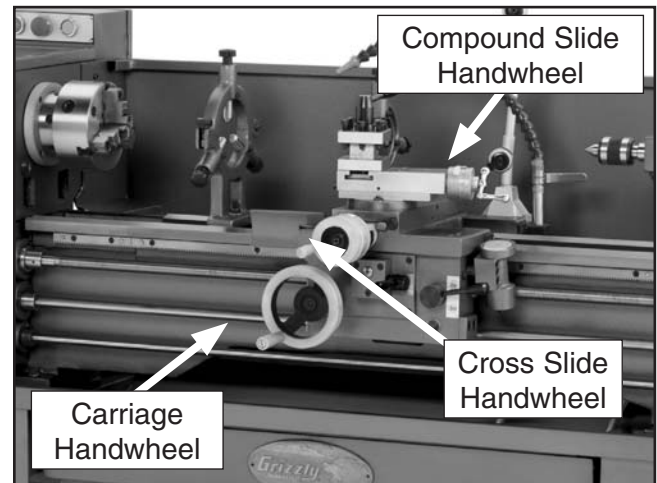


Figure 16. Carriage handwheel controls.

Carriage Handwheel

The carriage handwheel (**Figure 16**) moves the carriage left or right along the bed. This handwheel is used when setting up the machine or when manual control is desired during turning operations.

Cross Slide Handwheel

The cross slide handwheel (**Figure 16**) moves the cross slide toward and away from the work. Turning the dial clockwise moves the slide toward the workpiece. The graduated dial can be adjusted by holding the handwheel with one hand and turning the dial with the other.

Compound Slide Handwheel

The compound slide handwheel (**Figure 16**) controls the position of the cutting tool relative to the workpiece. This slide is adjustable to any angle within its range. The graduated dial is adjustable using the same method as the dial on the cross slide. Angle adjustment is locked by hex nuts on the base of the top slide.



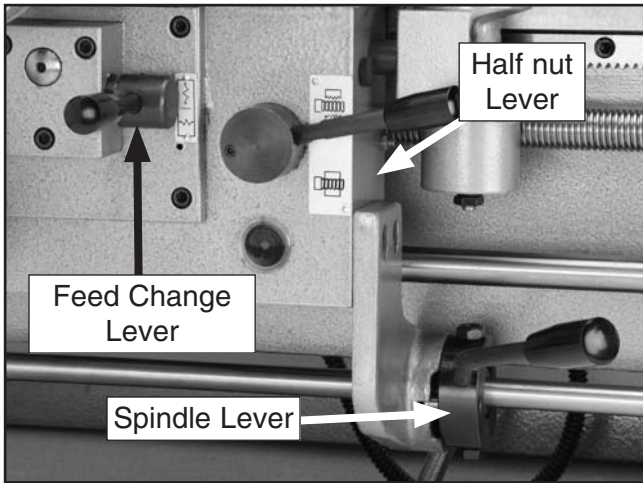


Figure 17. Carriage lever controls.

Spindle Lever

The spindle lever (**Figure 17**) is primarily used to start and stop the spindle and leadscrew in either the forward or reverse directions.

Feed Change Lever

The feed change lever (**Figure 17**) allows you to select which slide will operate with power feed. The lever pivots through two stops that require moving the lever left and right as well as up and down in order to engage the different components. Moving this lever upward selects power feed for the carriage. Moving the lever down selects power feed for the cross slide.

Half Nut Lever

The half nut lever (**Figure 17**) opens and closes the half nut on the longitudinal leadscrew, which engages the carriage power feed for threading.

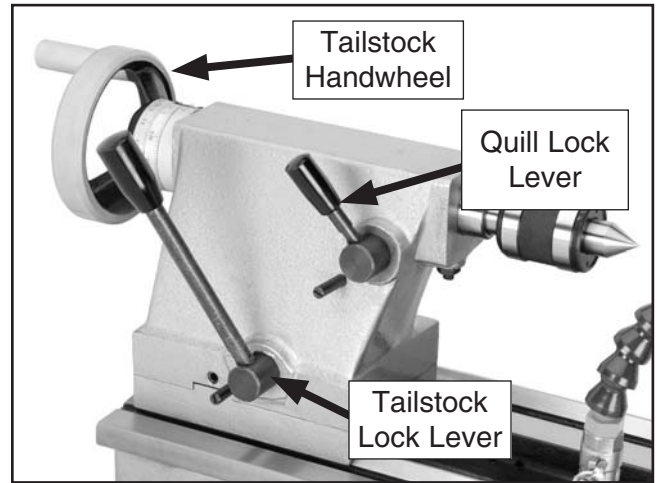


Figure 18. Tailstock controls.

Tailstock Handwheel

Turning the tailstock handwheel (**Figure 18**) advances or retracts the barrel in the tailstock. The graduated dial on the handwheel is adjustable.

Quill Lock Lever

The quill lock lever (**Figure 18**) locks the tailstock quill in place.

Tailstock Lock Lever

The tailstock lock lever (**Figure 18**) locks the tailstock in place on the lathe bed.



Chuck & Faceplate Mounting

This lathe is shipped with the 3-jaw chuck installed, but includes a four jaw chuck kit and 12" faceplate.

The chucks and faceplate mount to the spindle with a D1-4 camlock system. There are lines stamped into the cam and on the chuck body to indicate if the chuck is secured to the cam. A key is used to turn the locking cams (**Figure 19**).

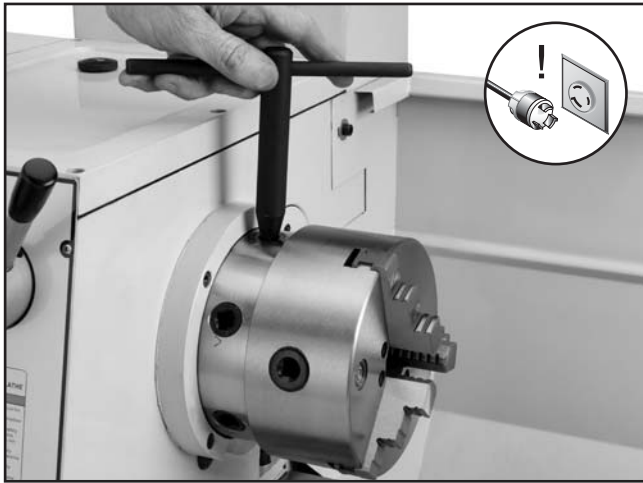


Figure 19. Key positioned to remove chuck.

⚠ WARNING

PINCH HAZARD! Protect your hands and the precision ground bedways with plywood or a chuck cradle when removing the lathe chuck! The heavy weight of a falling chuck can cause serious injury.

Removal

1. DISCONNECT LATHE FROM POWER!
2. Lay a chuck cradle (see **Figure 20**) or a layer of plywood over the bedways to protect the precision ground surfaces from damage and to prevent fingers from being pinched.

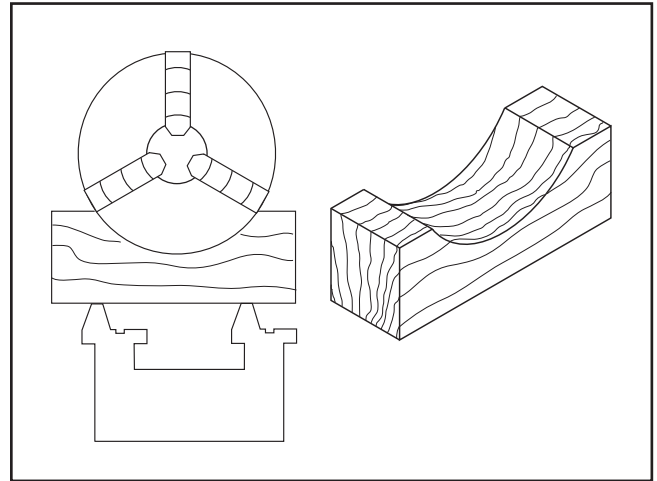


Figure 20. Simple chuck cradle made of scrap lumber.

3. Loosen the cam-locks by turning the key counterclockwise approximately one-third of a turn until the mark on the cam-lock aligns with the single mark on the spindle nose in **Figure 21**. If the cam-lock stud does not freely release from the cam-lock, wiggle the cam-lock until the cam-lock stud releases.

Note: These cam-locks may be very tight. A breaker bar may be used to add leverage.

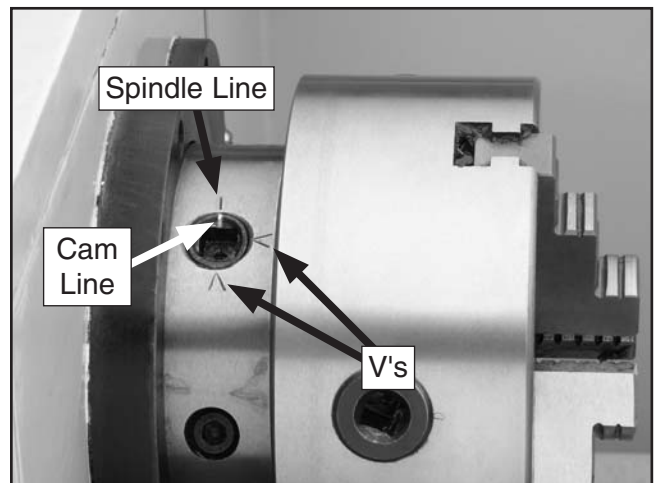


Figure 21. Indicator arrows.



- Using a dead blow hammer or other soft mallet, lightly tap around the outer circumference of the chuck body to break the chuck free from the cam-locks and from the spindle nose taper.

The chuck may come off at this point, so **it is important you are ready to support its weight.**

- With a rocking motion, carefully remove the chuck from the spindle nose (see **Figure 22**).

—If the chuck is still tight on the spindle, tap the back of the chuck with a rubber or wood mallet while supporting the bottom of the chuck with your free hand.

—If the chuck does not immediately come off, rotate the spindle approximately 60° and tap again. Make sure all the marks on the cams and spindle are in proper alignment.

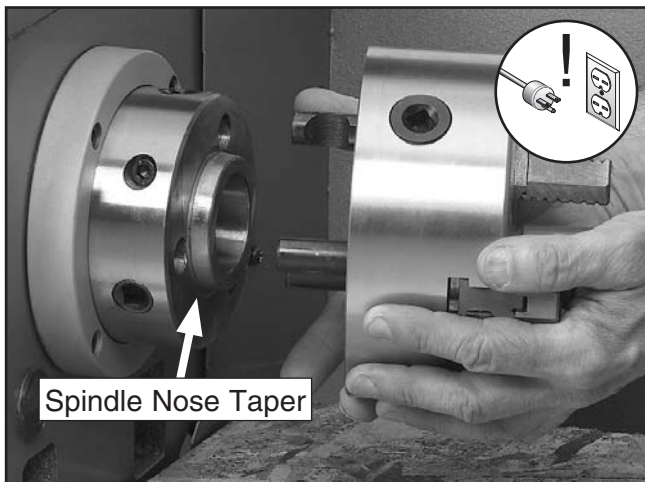


Figure 22. Installing and removing chuck.

⚠️ WARNING

Large chucks are very heavy. Always get assistance when removing or installing large chucks to prevent personal injury or damage to the chuck or lathe.

Installation

- DISCONNECT LATHE FROM POWER!**
- Lay a chuck cradle or a layer of plywood over the bedways to protect the precision ground surfaces from damage and to prevent fingers from being pinched (see **Figure 20**).
- Using your calipers, measure the height of the cam-lock studs from the previously installed chuck (see **Figure 23**).



Figure 23. Measuring height of cam-lock studs.

- Insert cam-lock studs into the new chuck/faceplate, and adjust the cam-lock stud height to match the measurement taken in **Step 3**.
- Thread in the cap screws to lock the cam-lock studs into position.



- Lift the chuck, and insert the studs onto the spindle nose (see **Figure 24**). While supporting the weight of the chuck/faceplate, turn one cam with the chuck key until the cam line is between the two V's on the spindle. Do not fully tighten at this time.

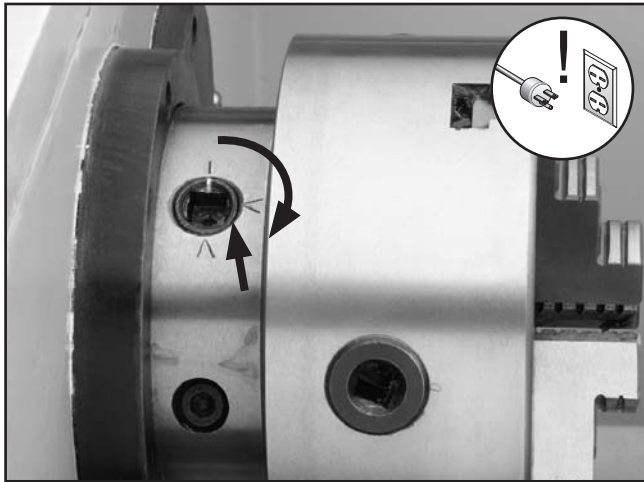


Figure 24. Tightening the cam-locks.

- Rotate the spindle and repeat **Step 4** on opposite cam.
- Rotate the spindle and repeat **Step 4** on the rest of the cams in an alternating manner.
- When all cams are snug, return to the first cam and tighten the cam completely. Repeat this step with the rest of the cams.

Three-Jaw Chuck

The three-jaw chuck included with this lathe is a scrolling-type chuck, which means all three jaws tighten at the same time when the chuck key is turned. As a result of this scrolling action, the jaws center the workpiece within 0.002"-0.003". Also, the jaws are reversible to accommodate different workpieces, as shown in **Figure 25**.

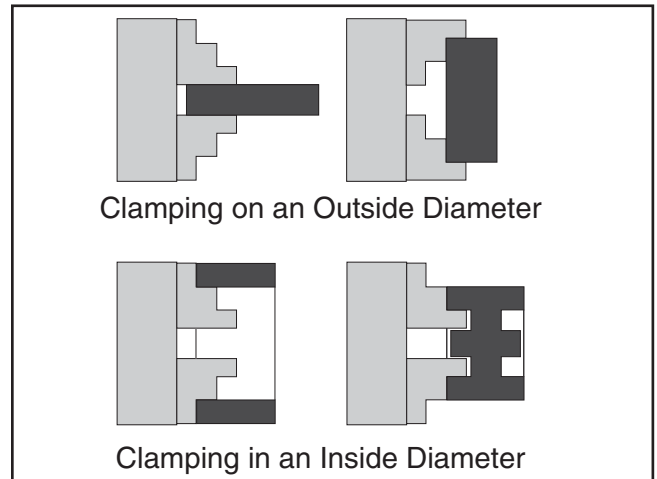


Figure 25. Loading a workpiece.

Reversing Jaws

- DISCONNECT LATHE FROM POWER!
- Remove the cap screws (**Figure 26**) from one of the jaws with an 8mm hex wrench, then remove the jaw.

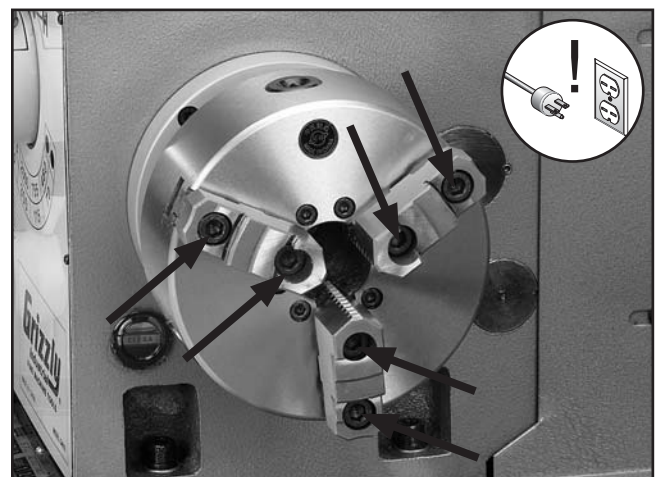


Figure 26. Cap screws securing the jaws.



3. Rotate the jaw 180° and replace the cap screws. Make sure the longer cap screw remains in the thicker part of the jaw. Repeat with the remaining jaws (**Figure 27**).

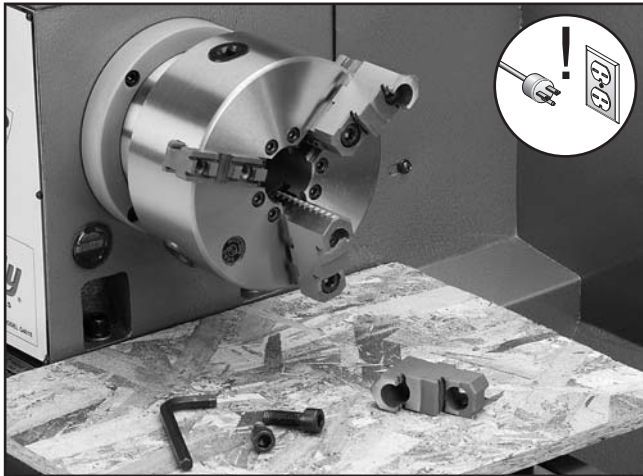


Figure 27. Reversing the chuck jaws.

Mounting Workpiece

1. Use the chuck key to open or close the jaws as necessary and position the workpiece in one of the four configurations shown in **Figure 25**.
2. Open/close the jaws until they make light contact with the workpiece.
3. Rotate the chuck by hand to make sure all three jaws evenly contact the workpiece and the workpiece is centered.

—If the workpiece is off center, loosen the jaws and adjust the workpiece.

—If the workpiece is centered, tighten the jaws.

<p>⚠ WARNING Securely clamp your workpiece and remove the chuck key! Thrown objects from a lathe can cause serious injury or death to the operator and to bystanders many feet away.</p>	
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Four-Jaw Chuck

The four-jaw chuck included with this lathe features independently adjustable hardened steel jaws. Each jaw can be removed from the chuck body and reversed for a wide range of work holding versatility. Install the four-jaw chuck according to the instructions on **Page 22**.

⚠ WARNING

Large chucks are very heavy. Always get assistance when removing or installing large chucks to prevent personal injury or damage to the chuck or lathe.

To mount a workpiece in the four-jaw chuck:

1. DISCONNECT LATHE FROM POWER!
2. Open each jaw with the chuck key until the workpiece can lie flat against the chuck face.
3. Support the workpiece and slide the dead center in the tailstock against the workpiece, then lock the tailstock. For more information, refer to the tailstock controls on **Page 21** and **Centers on Page 27**.
4. Turn the tailstock quill so the dead center applies enough pressure to the center point of your workpiece to hold it in place (**Figure 28**), then lock the tailstock quill.

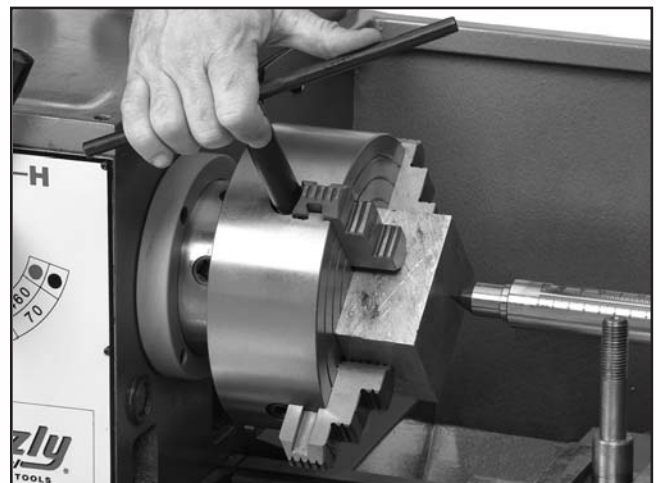


Figure 28. Centering workpiece (tool post removed for clarity).



5. Turn each jaw until it just makes contact with the workpiece.
6. Tighten each jaw in small increments. After adjusting the first jaw, continue tightening in opposing sequence (see **Figures 28 & 29**). Check frequently to make sure you have not wandered off your center point due to applying too much pressure to a single jaw.

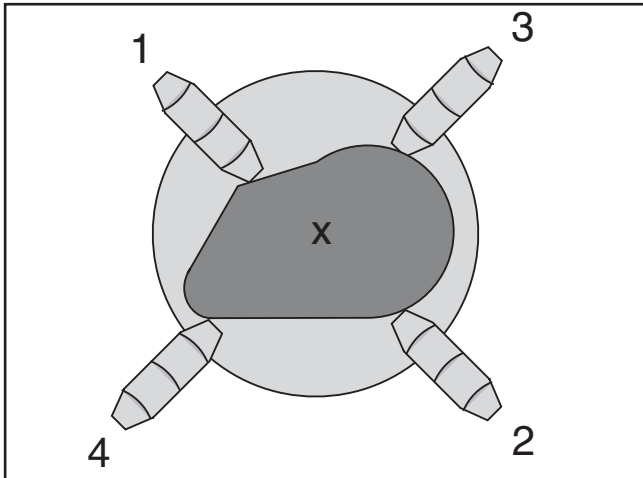


Figure 29. Jaw tightening sequence.

7. After the workpiece is held in place, back the tailstock away and rotate the chuck by hand. The center point will move if the workpiece is out of center (see **Figure 30**).

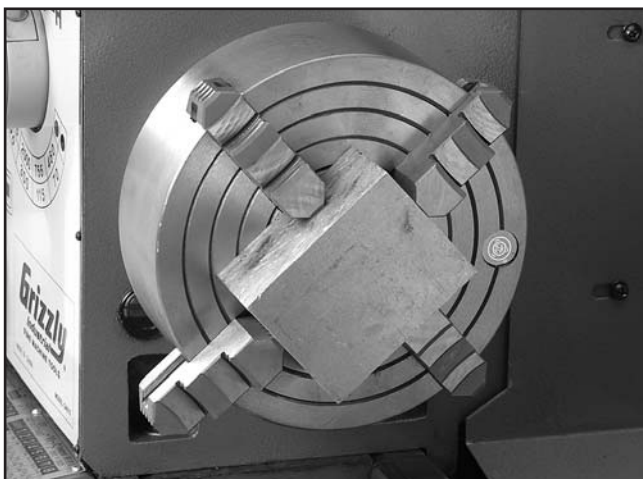


Figure 30. Properly held workpiece for offset machining at low RPM.

8. Make fine adjustments by slightly loosening one jaw and tightening the opposing jaw until the workpiece is precisely aligned.
9. Use low spindle speeds when machining heavy eccentric workpieces.

Faceplate

The faceplate is used to turn non-cylindrical parts and for off-center turning.

To mount a workpiece on the faceplate:

1. DISCONNECT LATHE FROM POWER!
2. Support the workpiece and slide the dead center in the tailstock against the workpiece, then lock the tailstock. For more information, refer to the tailstock controls on **Page 21** and **Centers on Page 27**.
3. Turn the tailstock quill so the dead center applies enough pressure to the center point of your workpiece to hold it in place.
4. Lock the tailstock quill when sufficient pressure is applied to hold the workpiece in place. Additional support may be needed, depending on the workpiece.

<p>!WARNING Securely clamp your workpiece and remove the chuck key! Thrown objects from a lathe can cause serious injury or death to the operator and to bystanders many feet away.</p>	
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Centers

- Secure the workpiece with a minimum of three independent clamping devices (see **Figure 31**). Failure to follow this step may lead to deadly injury to yourself or bystanders. Take into account rotation and the cutting forces applied to the workpiece when clamping to the faceplate. **Make sure your clamping application will not fail!**

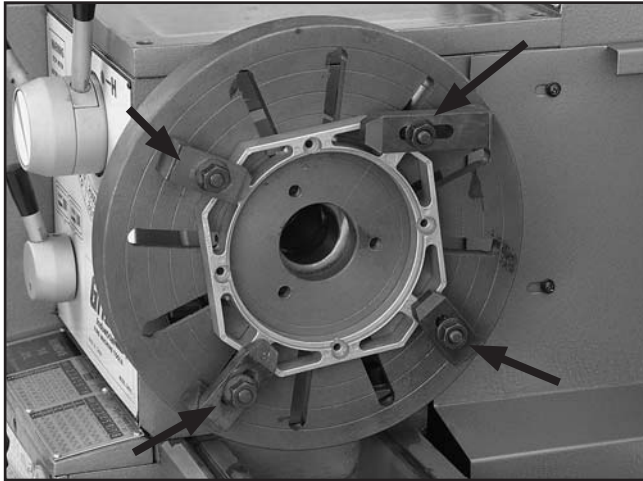


Figure 31. Faceplate with properly clamped workpiece in four locations.

!WARNING

Use a minimum of three independent clamping devices when using faceplate. Failure to provide adequate clamping will cause workpiece to eject during operation.

- Use a lower spindle speed when machining heavy eccentric workpieces.

The Model G9036 lathe is supplied with two MT#3 dead centers and a MT#5-MT#3 adapter sleeve to fit MT#3 centers into the spindle.

Matching tapers in the spindle or tailstock quill provide the locking action. Before installing any center or arbor, make sure that the mating surfaces are perfectly clean. These parts will last longer and remain accurate if properly maintained. If oil is present on the mating surfaces, the tapers will not interlock.

Most often, a dead center or live center is used in the tailstock to support workpieces. Dead centers do not spin during use and the tip must be constantly lubricated.

NOTICE

Failure to keep a dead center tip well lubricated will damage dead center and workpiece.

Live centers are typically built with bearings and spin during use, so they do not need lubrication during operation. When using a live center, the tailstock barrel should protrude at least $\frac{1}{2}$ " but not more than 3" (see **Figure 32**).

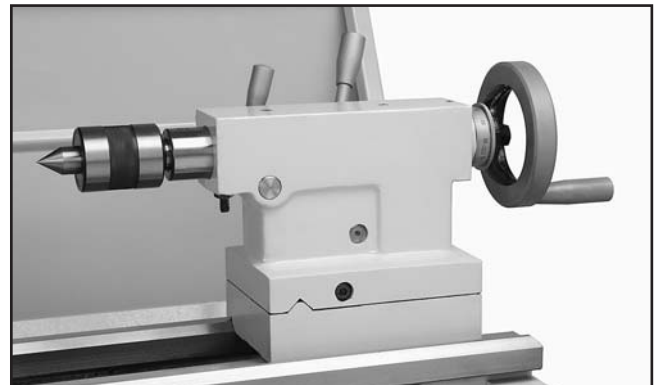


Figure 32. Live center installed in a tailstock.



When a center is used in the spindle, the most common application is using it with a faceplate (see **Figure 33**).

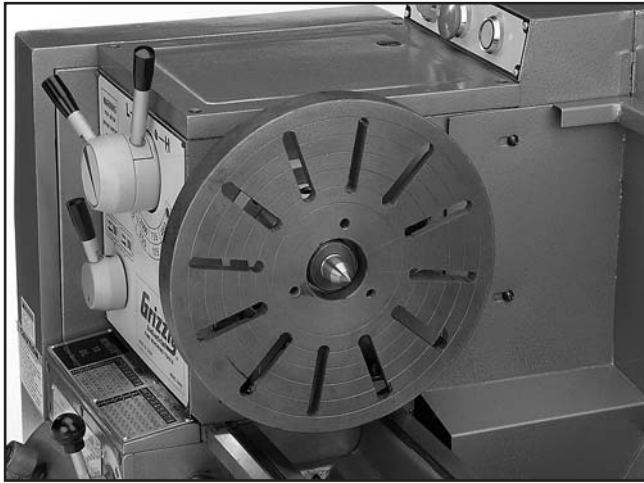


Figure 33. Typical faceplate and dead center setup.

Mounting Center in Tailstock

1. Feed the quill out about 1" so that the center can be inserted.
2. Insert the center into the quill opening (see **Figure 34**).



Figure 34. Inserting a dead center in a tailstock.

3. Position the tailstock so the center presses against the workpiece, then lock the tailstock in place.
4. Feed the quill into the workpiece. The force of a mounted workpiece will fully seat the taper.

Note: Make sure there is a center drilled hole in the end of the workpiece for the center.

5. Lock the quill into place once the center and the part rotate together. The quill may need to be adjusted during operation.
6. To remove a center, retract the quill until the center pops free. Be sure to catch it when it comes out to avoid damaging the tip.

Mounting Center in Spindle

1. Remove the chuck from the spindle.
2. Install the dead center in the spindle sleeve.
3. Install the sleeve into the spindle opening.
4. Attach the faceplate to the spindle.

Note: When using the dead center in the spindle, use a lathe dog so that your part will rotate with the spindle and not spin on the dead center tip.



Offsetting Tailstock

The tailstock can be offset slightly to cut shallow tapers. To return the tailstock back to original position, repeat the process until the centered position is indicated on the scale and perform the **Aligning Tailstock** instructions.

To set up the tailstock to cut a shallow taper:

1. Lock the tailstock in position and loosen the set screw located on the end of the tailstock (see **Figure 35**).

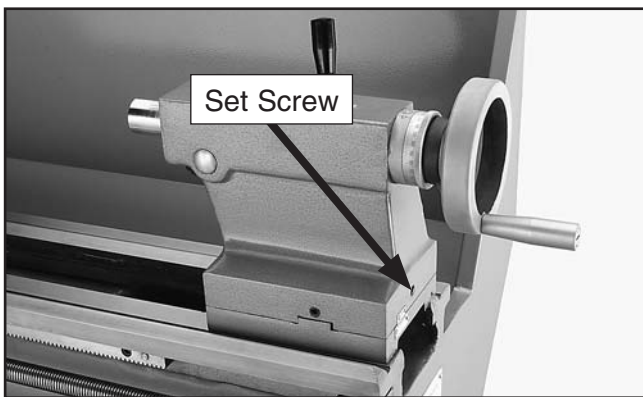


Figure 35. Tailstock off-set adjustments.

2. Alternately loosen and tighten the two adjustment screws until the desired offset is indicated on the offset scale (see **Figure 36**).

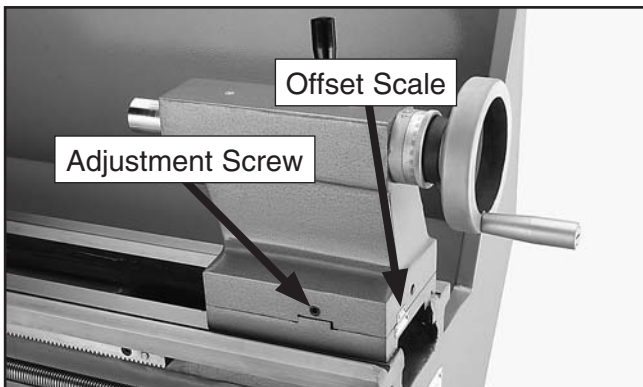


Figure 36. Offset scale.

3. Tighten the set screw located on the end of the tailstock to lock the setting.

Aligning Tailstock

The tailstock alignment was set at the factory with the headstock. However, we recommend that you take the time to ensure that the tailstock is aligned to your own desired tolerances.

To align the tailstock:

1. Center drill a 6" long piece of bar stock on both ends. Set it aside for use in **Step 4**.
2. Make a dead center by turning a shoulder to make a shank. Flip the piece over in the chuck and turn a 60° point (see **Figure 37**). As long as it remains in the chuck, the point of your center will be accurate to the spindle axis.

Note: Keep in mind that the point will have to be refinished whenever it is removed and returned to the chuck.

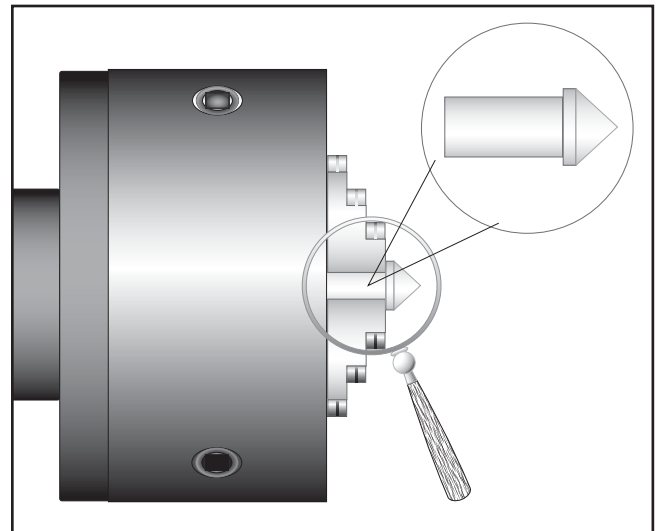


Figure 37. Finished dead center.

3. Place the live center in your tailstock.



- Attach a lathe dog at the spindle end to the bar stock from **Step 1** and mount it between the centers (as shown in **Figure 38**).

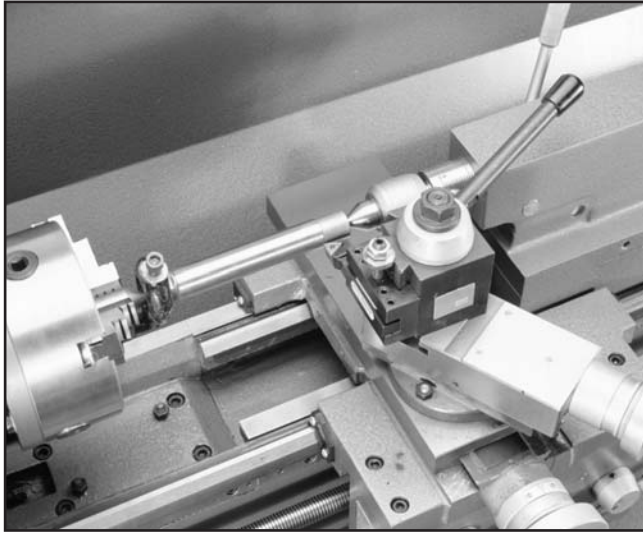


Figure 38. Bar stock mounted on centers.

- Turn approximately 0.010" off the diameter.
- Mount a dial indicator so that the plunger is on the tailstock barrel (**Figure 39**).

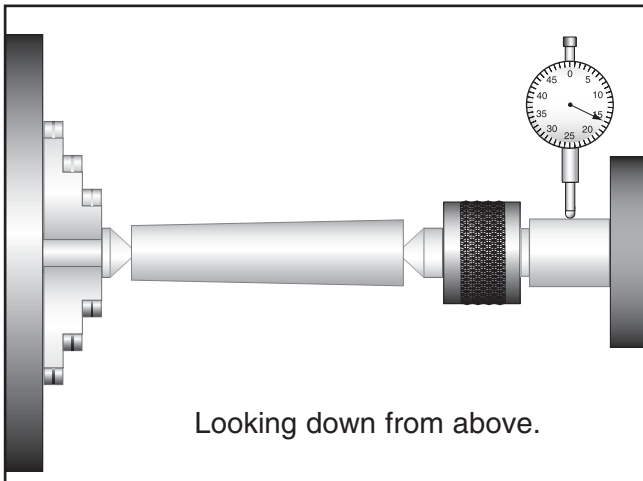


Figure 39. Adjusting for headstock end taper.

- Measure the stock with a micrometer. If the stock is wider at the tailstock end, the tailstock needs to be moved toward the operator the amount of the taper (**Figure 39**).

- If the stock is thinner at the tailstock end, the tailstock needs to be moved away from the operator by at least the amount of the taper (**Figure 40**).

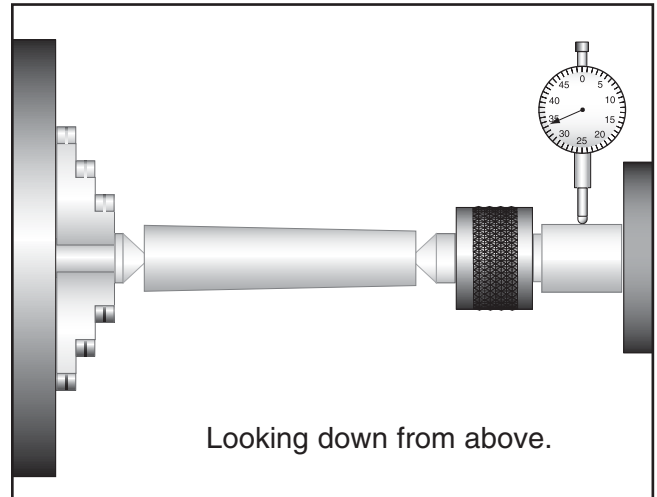


Figure 40. Adjusting for tailstock end taper.

NOTICE

DO NOT forget to lock the tailstock to the ways after each adjustment.

- Loosen the tailstock lock lever and adjust the tailstock offset by the amount of the taper by turning the adjustment screw (**Figure 41**). Turn another 0.010" off of the stock and check for taper. Repeat as necessary until the desired amount of accuracy is achieved.

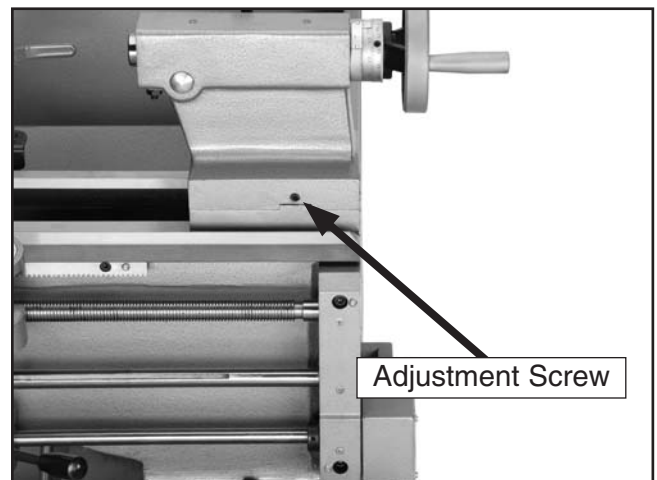


Figure 41. Tailstock adjustment locations.



Drilling with Tailstock

The tailstock can be used to drill holes by mounting a drill bit in the tailstock, rotating the workpiece with the spindle, then using the tailstock quill feed handwheel to advance the drill bit into the workpiece.

To set up the tailstock for drilling:

1. Lock the tailstock in position, then unlock the quill.
2. Use the quill feed handwheel to extend the quill about one inch out of the tailstock.
3. Insert a tapered drill arbor (**Figure 42**), or the tapered drill shank (**Figure 43**), into the quill until the taper is firmly seated. The matching tapers hold the arbor.

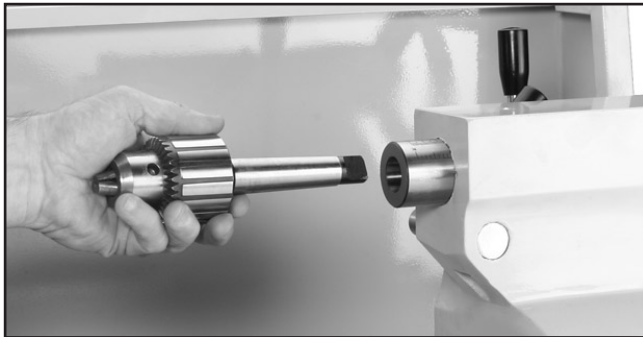


Figure 42. Typical chuck installation.

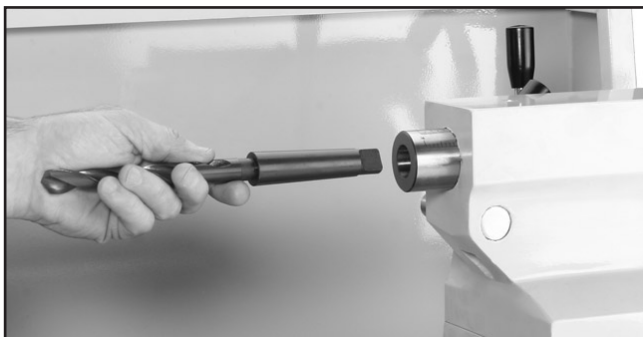


Figure 43. Typical drill bit installation.

To remove a tapered drill arbor:

1. Turn the quill feed handle counterclockwise until the chuck is pushed out from the tailstock taper.

Coolant System

The coolant system delivers cutting fluid via a positional nozzle. The coolant system is controlled by a pump switch located on the control panel and a valve lever near the base of the nozzle (**Figure 44**). The coolant pump will burn out if it is run without cutting fluid in the coolant tank.

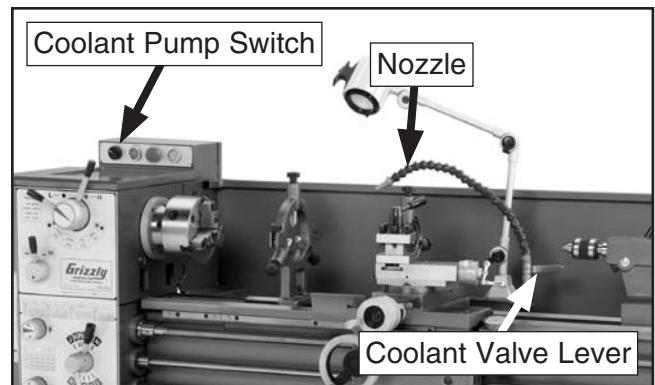


Figure 44. Coolant system controls.

NOTICE

Running the coolant pump without adequate coolant in the coolant reservoir may permanently damage the coolant system on your lathe. This action is considered abuse and is not covered by the warranty.

Always use high quality cutting fluid in your coolant system and follow the manufacturer's instructions for diluting. Remain aware of the condition of the cutting fluid and change it promptly when it becomes overly dirty or rancid. Refer to **Page 46** in the **Maintenance** section for details on changing the cutting fluid.

To use the coolant system on your lathe:

1. Make sure the coolant tank is properly serviced and filled with cutting fluid.
2. Position the coolant nozzle as desired for your operation.
3. Use the control panel switch to turn the coolant pump **ON**.
4. Adjust the flow of coolant by using the valve lever at the base of the nozzle hose.



Steady Rest

The steady rest serves as a support for long shafts. The steady rest can be placed anywhere along the length of the part.

To install/use the steady rest:

1. Place the steady rest on the lathe bedways so the triangular notch fits over the angled portion of the rear bedway.
2. Loosen the three set screws so the finger position can be adjusted (see **Figure 45**).

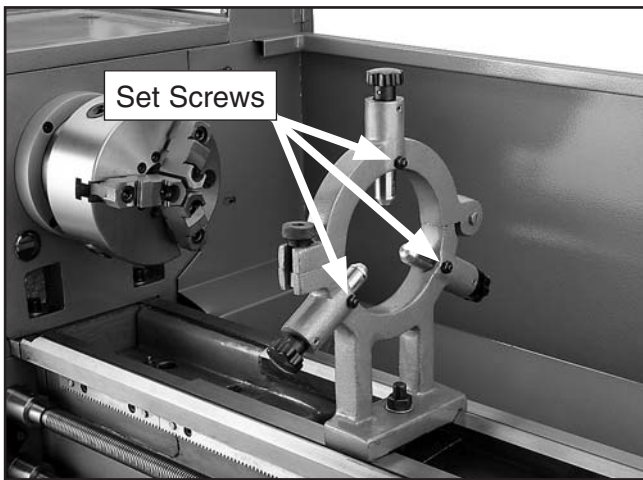


Figure 45. Steady rest adjustments.

3. Loosen the knurled screw and open the steady rest so a workpiece can fit inside (see **Figure 46**).

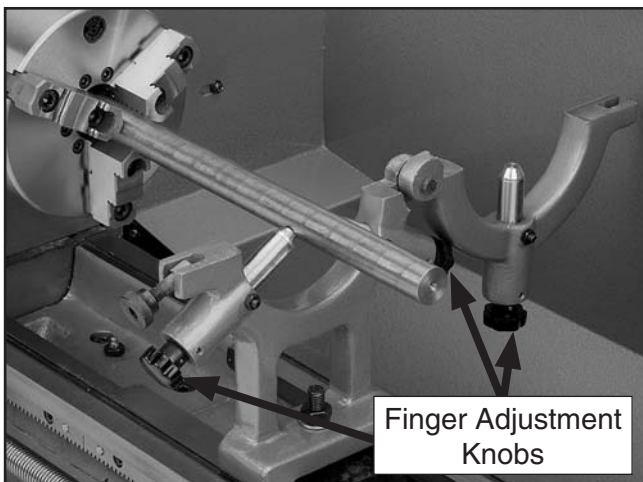


Figure 46. Positioning workpiece in steady rest.

4. Position the steady rest where desired. Tighten the bolt at the base of the steady rest to secure in place.
5. Close the steady rest so that the workpiece is inside the fingers and tighten the knobs.
6. Set the fingers snug to the workpiece and secure by tightening the set screws. Fingers should be snug and allow rotational movement of the workpiece. Lubricate the finger tips with an anti-seize grease before and during operation.
7. After prolonged use, the fingers will show wear. Either mill or file the tips for a new contact surface.

Follow Rest

The follow rest in **Figure 47** is mounted on the saddle and follows the movement of the tool. It can be attached/removed by two cap screws located at the base of the follow rest. The follow rest requires only two fingers as the cutting tool acts as the third. The follow rest is used on long, slender parts to prevent flexing of the workpiece from the pressure of the cutting tool.

The sliding fingers are set similar to those of the steady rest—free of play but not binding. Always lubricate before and during operation. Remove the follow rest from the saddle when not in use. After prolonged use, the fingers will need to be milled or filed to cleanup the contact surface.



Figure 47. Follow rest attachment.



Tool Post

The tool post included with the Model G9036 is a four-way tool post. The tool post is mounted on top of the compound slide, and allows a maximum of four tools to be loaded simultaneously.

The four-way tool post allows for quick indexing to new tools. This is accomplished by rotating the top handle counterclockwise and then rotating the tool post to the desired position. Rotate the top handle clockwise to lock the tool into position.

To load the tool post:

1. Choose the desired cutting tool.
2. Loosen the tool post bolts so that the cutting tool can fit underneath the tool post bolts.
3. Use a minimum of two tool post bolts to hold down the cutting tool and tighten firmly (see **Figure 48**).

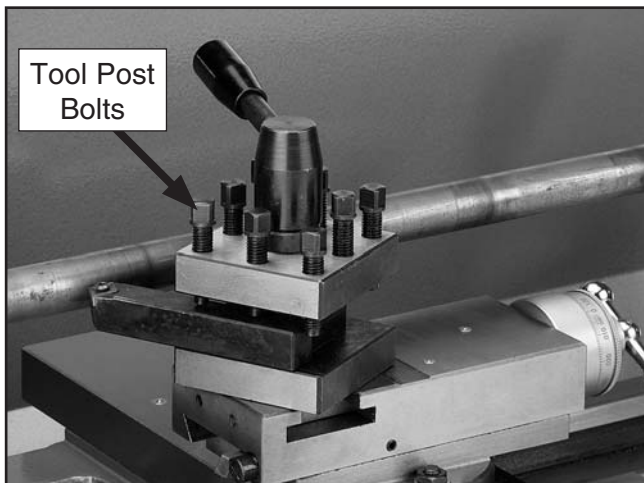


Figure 48. Tool post bolts.

4. Repeat **Steps 1–3** for the three remaining openings, as needed.

Spindle Speed

The correct spindle speed is determined by the workpiece material, the type of tooling used, and the desired finish. Refer the chart in **Figure 49** and the instructions below for calculating the correct spindle speed for your application.

To calculate the correct spindle speed:

1. Use the chart in **Figure 49** to determine the cutting speed required for the workpiece material.

Recommended Cutting Speeds		
Work Material	Average Tool Speed (sfm)	
	Rough Cuts	Finish Cuts
Magnesium	400	800
Aluminum	350	700
Brass & Bronze	250	500
Copper	100	250
Cast Iron (Soft)	100	250
Cast Iron (Hard)	50	150
Mild Steel	100	250
Cast Steel	70	150
Alloy Steels (Hard)	50	150
Tool Steel	50	150
Stainless Steel	60	180
Titanium	90	200
Hi Manganese Steel	40	100

Note: These values are based on HSS cutting tools. For carbide cutting tools, double the average speed. These values are a guideline only. Refer to the MACHINERY'S HANDBOOK for more detailed information.

Figure 49. Cutting speed chart.

2. Determine the final diameter, in inches, for the cut you are about to take.

Note: For this step, you will need to average out the diameters or work with the finish diameter for your calculations.



- Use the following formula to determine the needed spindle speed for your operation:

$$\text{Spindle Speed} = \frac{\text{Cutting Speed (SFM)} \times 4}{\text{Diameter of Cut}}$$

Example 1

You will turn 1/2" diameter piece of aluminum stock, using a HSS cutting tool.

Step 1:

300 (SFM from chart) x 4 = 1200

Step 2:

1200 / .5" (Diameter of workpiece) = 2400 RPM

Result:

The correct spindle speed is 2400 RPM.

Example 2:

You will turn a 1" diameter piece of stainless steel, using a carbide cutting tool.

Step 1:

60 (SFM from chart) x 2 (for carbide tool) = 120

Step 2:

120 (determined SFM) x 4 = 480

Step 3:

480 / 1" (Diameter of workpiece) = 480 RPM

Result:

The correct spindle speed is 480 RPM.

- With the calculated spindle speed, examine the spindle speed chart on the front of the headstock to find the closest match.

Note: In most cases the calculated spindle speed will be between the available speeds. Use your best judgement when choosing either a higher or lower spindle speed.

- Make sure the spindle is completely stopped before proceeding.
- Move the High/Low lever shown in **Figure 50** to the range for your desired speed. Typically the spindle must be slightly rotated by hand to allow the gears to engage when moving the spindle speed levers.

Note: If the High/Low lever is in the Neutral position, the spindle will not spin when the motor is turned **ON**.

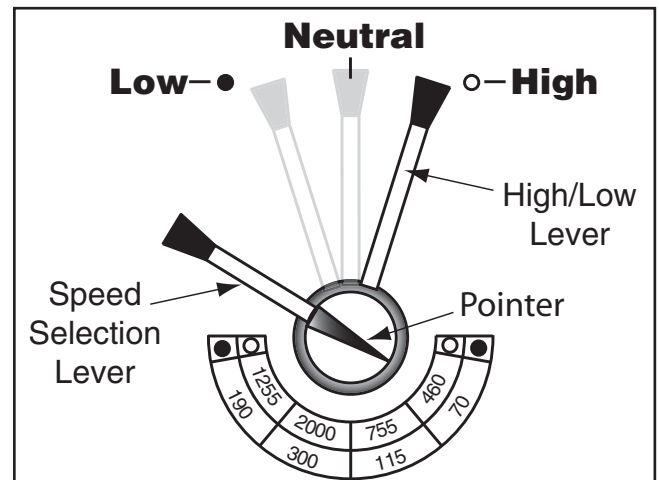


Figure 50. Spindle speed levers; High/Low lever positioning.

- Move the speed selection lever, so the pointer on the hub points to the desired speed setting (see **Figure 50**).



Power Feed

NOTICE

Feed rate is based on spindle RPM. High feed rates combined with high spindle speeds result in a rapidly moving carriage or cross slide. Pay close attention to the feed rate you have chosen and keep your hand poised over the feed switch. Failure to fully understand this will cause the carriage to crash into the spindle.

"Power Feed" on a lathe simply means using the machine driven components to feed the tool into the workpiece rather than feeding them manually using handwheels. On the Model G9036, both the carriage and the cross slide have power feed options. The carriage feeds right or left, and the cross slide feeds in or out.

The power feed engagement is controlled by the feed direction lever and the feed change lever, shown in **Figure 51**.

The speed at which these components travel is set with the feed speed controls (see **Feed Rates** on **Page 36**).

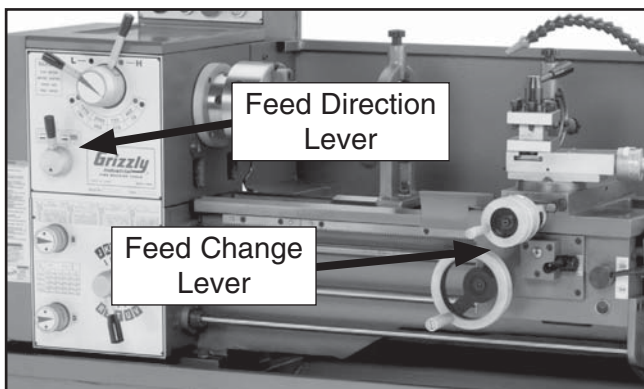


Figure 51. Power feed controls.

To engage the power feed:

1. Turn the spindle **OFF** and allow it to completely stop before making gear changes.

2. Move the feed direction lever to the desired longitudinal feed setting indicated by the arrow above the screw thread. Cross feed directions are as follows: when the arrow points left, the cross feed is away from the spindle axis; when arrow points right, the cross feed is towards the spindle axis (see **Figure 52**).

Note: These instructions are valid with a counterclockwise or forward rotation of the spindle. All directions reverse when spindle rotation is reversed.

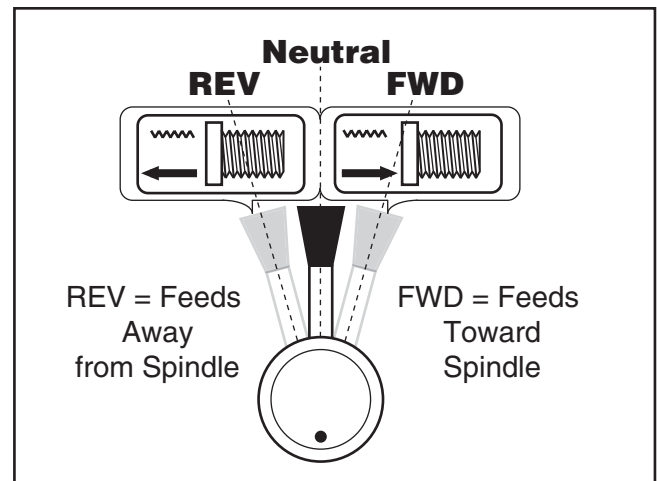


Figure 52. Feed direction lever positions.

3. Move the feed change lever handle down to engage the cross slide and up to engage the carriage, as shown in **Figure 53**.

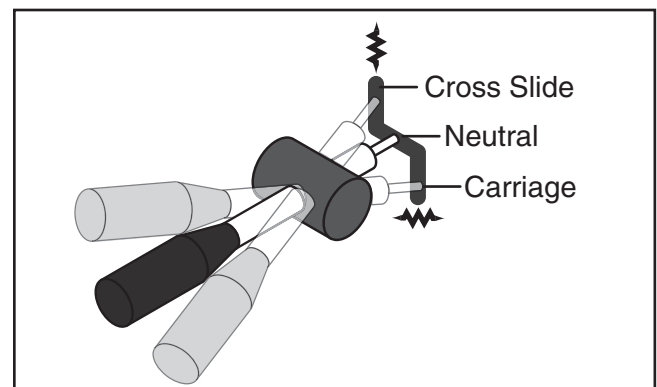


Figure 53. Feed change lever positions.

4. Return the lever to the neutral position to disengage the power feed.



Feed Rates

Feed rate is the speed the tooling travels during operation. When the power feed is used, the feed rate is controlled by the feed speed levers and knobs.

The correct feed speed is determined by the workpiece material, the type of tooling used, and the desired finish. The chart in **Figure 54** shows the recommended feed rates for turning most metals.

Work Material	Tool Feed Rate (IPR)	
	Rough Cuts	Finish Cuts
Magnesium	0.015–0.025	0.005–0.010
Aluminum	0.015–0.025	0.005–0.010
Brass & Bronze	0.015–0.025	0.003–0.010
Copper	0.010–0.020	0.004–0.008
Cast Iron (Soft)	0.015–0.025	0.005–0.010
Cast Iron (Hard)	0.010–0.020	0.003–0.010
Mild Steel	0.010–0.020	0.003–0.010
Cast Steel	0.010–0.020	0.003–0.010
Alloy Steels (Hard)	0.010–0.020	0.003–0.010
Tool Steel	0.010–0.020	0.003–0.010
Stainless Steel	0.010–0.020	0.003–0.010
Titanium	0.010–0.020	0.003–0.010
Hi Manganese Steel	0.010–0.020	0.003–0.010

Note: These values are a guideline only. Refer to the MACHINERY'S HANDBOOK for more detailed information.

Figure 54. Feed rate chart.

To set the feed rate:

1. Turn the spindle **OFF** and allow it to completely stop before moving the feed rate levers.

NOTICE

NEVER move levers while the lathe is running, and **NEVER** force any lever when shifting. If the lever will not engage, rotate the chuck by hand while keeping light pressure on the lever. As the chuck rotates it aligns the gears and the lever will engage.

2. Review the chart shown in **Figure 55** to determine the correct configuration for your desired feed rate.

The chart shows two numbers separated by a slash in each box. The top number is the carriage feed rate and the bottom number is the cross slide feed rate.

The chart also shows the gear configuration (upper left-hand corner) needed to reach the feed speeds shown on the chart.

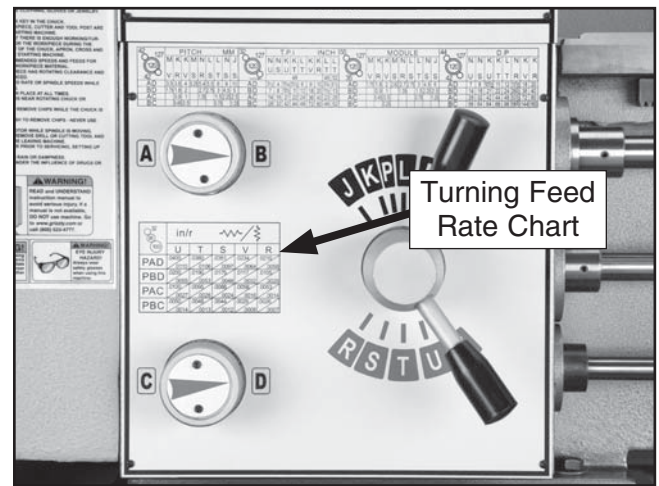


Figure 55. Feed rate chart for turning.

For Example: For a carriage feed rate of 0.0100", the knob/lever configuration is PACU with the 32, 85, and 100 tooth gears positioned as shown (see **Figure 56**).

Gear Configuration	in/r				
	U	T	S	V	R
32 85 100					
PAD	.0400	.0380	.0351	.0234	.0210
PBD	.0110	.0106	.0097	.0064	.0058
PAC	.0200	.0190	.0175	.0117	.0105
PBC	.0055	.0053	.0048	.0032	.0029
	.0100	.0095	.0088	.0058	.0053
	.0027	.0026	.0024	.0016	.0014
	.0050	.0048	.0044	.0029	.0026
	.0014	.0013	.0012	.0008	.0007

Figure 56. Choosing 0.0100" carriage feed rate.

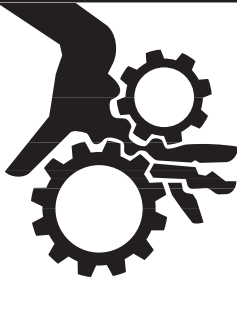
3. Turn the knobs and levers so each one points to its respective letter in the indicated configuration.



Thread Settings & Change Gears

The Model G9036 is capable of cutting metric, inch, module, and diametral pitch threads. The charts near the feed speed controls show how to configure the change gears, levers, and knobs for each type of thread.

The Model G9036 is shipped from the factory with the 32, 85, and 100 tooth gears installed in the machine, which is the configuration for turning power feeds. The change gears are located on the left-hand side of the lathe, behind the headstock cover.



⚠ WARNING
Always disconnect machine from power before changing gears. Accidentally starting machine during gear changes can cause serious personal injury.

The following example explains a threading setup for 1.75 pitch metric threads. Since all the threading charts work the same way, completing this example will show you how to set up your lathe for threading any pitch shown on the charts.

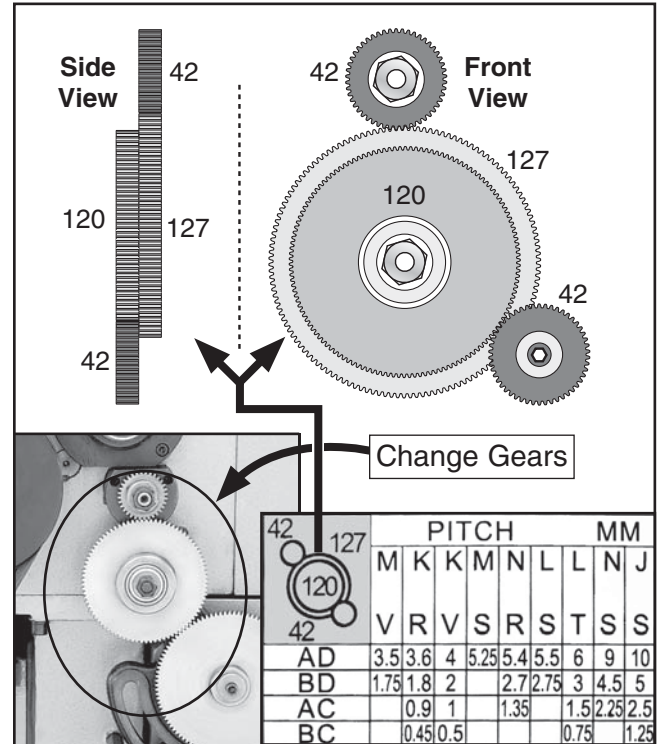
To set up for 1.75 pitch metric threads:

1. DISCONNECT LATHE FROM POWER!
2. Remove the cover on the left-hand side of the headstock to expose the change gears.
3. Review the threading charts and find the chart indicated for metric pitch (**Figure 57**).

42	127	PITCH								MM	
		M	K	K	M	N	L	L	N	J	
42	120	V	R	V	S	R	S	T	S	S	
AD		3.5	3.6	4	5.25	5.4	5.5	6	9	10	
BD		1.75	1.8	2	2.7	2.75	3	4.5	5		
AC		0.9	1		1.35	1.5	2.25	2.5			
BC		0.45	0.5			0.75	1.25				

Figure 57. Metric thread pitch chart.

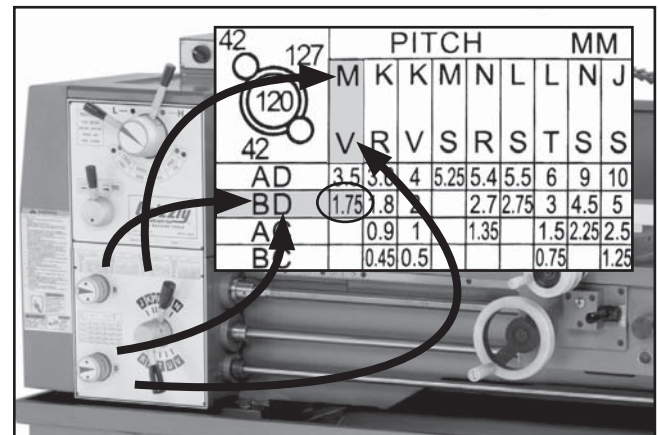
4. Install the necessary change gears shown on the chart and position them so they mesh where indicated (**Figure 58**), but leaving 0.05"–0.08" backlash between gears.



42	127	PITCH								MM	
		M	K	K	M	N	L	L	N	J	
42	120	V	R	V	S	R	S	T	S	S	
AD		3.5	3.6	4	5.25	5.4	5.5	6	9	10	
BD		1.75	1.8	2	2.7	2.75	3	4.5	5		
AC		0.9	1		1.35	1.5	2.25	2.5			
BC		0.45	0.5			0.75	1.25				

Figure 58. Setting up change gears for metric pitch threading.

5. Rotate the spindle by hand to ensure the gears can spin and are not meshed so tightly that they bind, adjust them if necessary, then re-install the cover removed in **Step 2**.
6. Move the threading dials and levers to the positions that line up with the 1.75 box. The shaded boxes in **Figure 59** show that this configuration is BDMV.



42	127	PITCH								MM	
		M	K	K	M	N	L	L	N	J	
42	120	V	R	V	S	R	S	T	S	S	
AD		3.5	3.6	4	5.25	5.4	5.5	6	9	10	
BD		1.75	1.8	2	2.7	2.75	3	4.5	5		
A		0.9	1		1.35	1.5	2.25	2.5			
BC		0.45	0.5			0.75	1.25				

Figure 59. Thread control settings for 1.75 pitch.



Threading Controls

The purpose of this section is to orient you with the controls used with threading and how to use the threading dial on this machine.

Feed Direction Lever

When the lathe is setup as shown on the threading charts, the leadscrew is engaged with the gears in the headstock and will automatically turn when engaged by the feed direction lever. The leadscrew will not turn when the feed direction lever is in the neutral position.

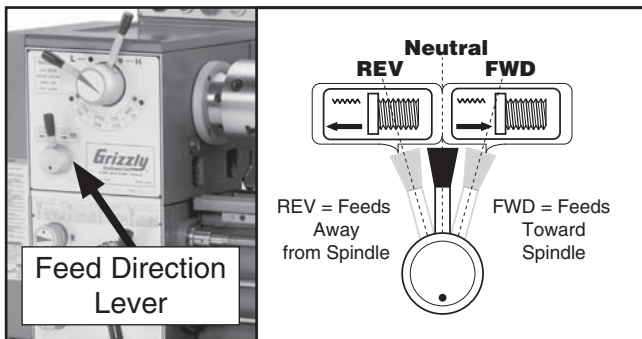


Figure 60. Feed direction controls for threading.

Feed Change Lever

The feed change lever must be in the neutral position for threading operations or the half nut will not be able to engage with the leadscrew.

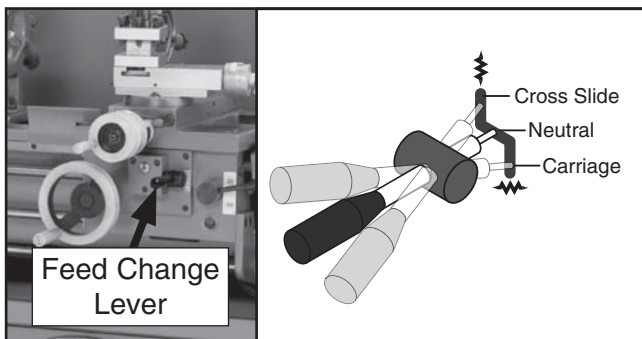


Figure 61. Feed change lever controls.

Half Nut Lever

The half nut lever engages the carriage with the leadscrew. Typically, the longitudinal handwheel must be moved slightly to help the half nut engage on the leadscrew (Figure 62).

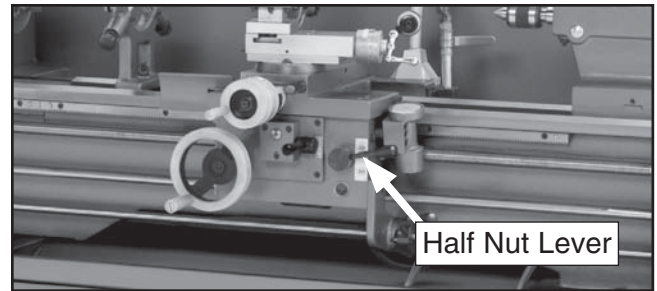


Figure 62. Half nut lever.

CAUTION

DO NOT engage the half nut when the spindle is operating over 200 RPM. Disregarding this warning may cause damage to the leadscrew and bearings.

Thread Dial & Chart

The numbers on the thread dial are used with the thread dial chart to show when to engage/disengage the half nut during SAE threading operations. The thread dial must be engaged with the leadscrew to work. To engage the thread dial, loosen the mounting cap screw, pivot it into the leadscrew so the gear teeth mesh with the leadscrew, then tighten the cap screw.

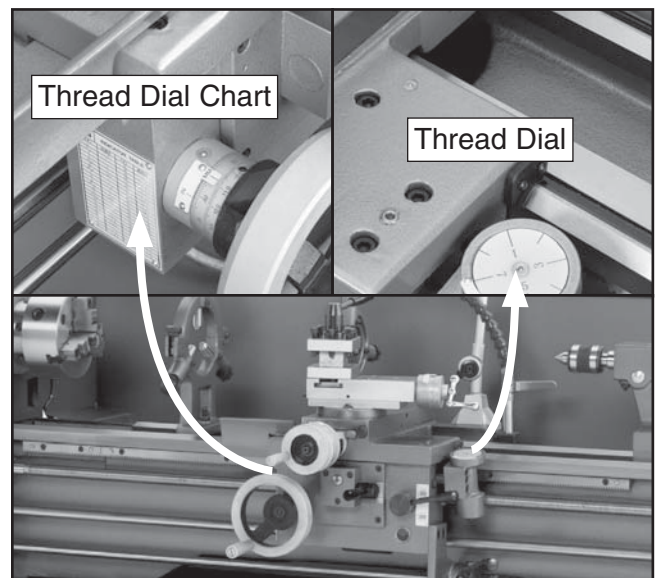


Figure 63. Thread dial chart and thread dial.



To use the thread chart, find the TPI that you want to cut and reference the "Scale" number(s) next to it. The scale number(s) indicate when to engage the half nut when cutting that TPI.

For Example: If you are cutting 18 TPI threads, the chart shows "1 or 3" next to the 18 (see the shaded boxes in **Figure 64**).

Indicator Scale			
TPI	Scale	TPI	Scale
4	1 - 4	24	1 - 8
4½	1	26	1 or 3
5	1	28	1 - 4
5½	1	32	1 - 8
6	1 or 3	36	1 - 4
6½	1	38	1 or 3
7	1	40	1 - 8
8	1 - 8	44	1 - 4
9	1	46	1 or 3
9½	1	48	1 - 8
10	1 or 3	52	1 - 4
11	1	56	1 - 8
11½	1	64	1 - 8
12	1 - 4	72	1 - 8
13	1	76	1 - 4
14	1 or 3	80	1 - 8
16	1 - 8	88	1 - 8
18	1 or 3	92	1 - 4
19	1	96	1 - 8
20	1 - 4	104	1 - 8
22	1 or 3	112	1 - 8
23	1		

Figure 64. Thread dial chart.

A "1 or 3" means that you must engage the half nut when the 1 or 3 scale mark lines up with the fixed indicator, shown in **Figure 65**.

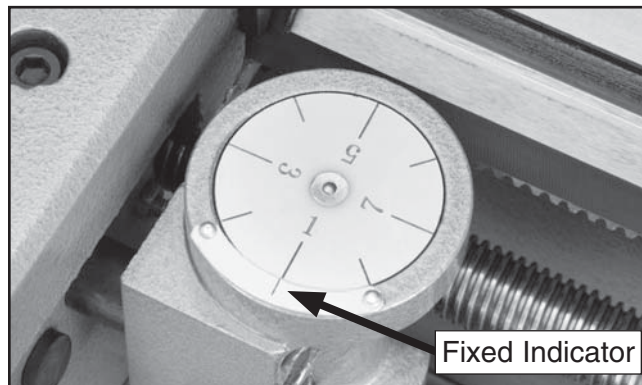


Figure 65. Thread dial close-up.

A "1" means that you can only engage the half nut when the 1 lines up with the fixed indicator.

A "1-8" means that you can engage the half nut when the fixed indicator lines up with any number on the dial.

To maintain accuracy and consistency, engage the half nut on the same number mark on each pass. Failure to start on the same number each time may lead to cutting off the thread made in the previous pass.



SECTION 5: ACCESSORIES

H6879—Lathe Operation & Maintenance Book

This detailed metal lathe book provides extensive coverage of a wide variety of metalworking operations. Special emphasis is placed on lathe components, accessories, and operating procedures, including basic machine setup and routine maintenance. A "must have" reference for all metal lathe owners. 260 pages.

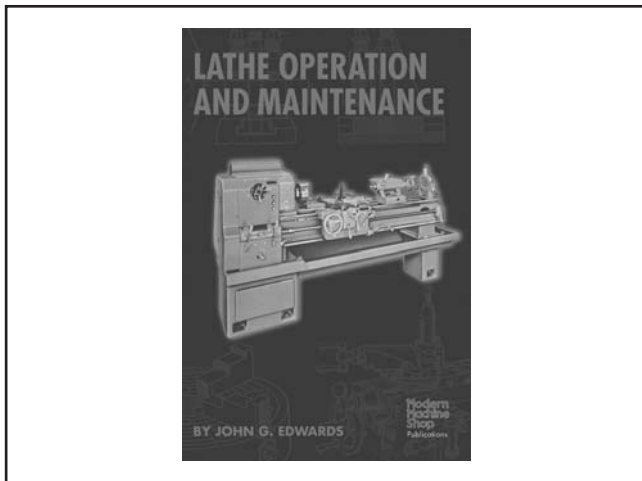


Figure 66. H6879 Lathe Operation & Maintenance Book.

Quick Change Tool Holders

All models are Series 200

G5701—Boring Bar Holder $\frac{3}{4}$ "

G5704—Parting Tool Holder $\frac{5}{8}$ "

G5705—Knurling Tool Holder $\frac{1}{4}$ "~ $\frac{5}{8}$ "

G5703—Morse Taper Holder MT#3

G5700—Turning/Boring Holder $\frac{1}{4}$ "~ $\frac{5}{8}$ "; $\frac{1}{2}$ " \varnothing

G5699—Turning Holders $\frac{1}{4}$ "~ $\frac{5}{8}$ "

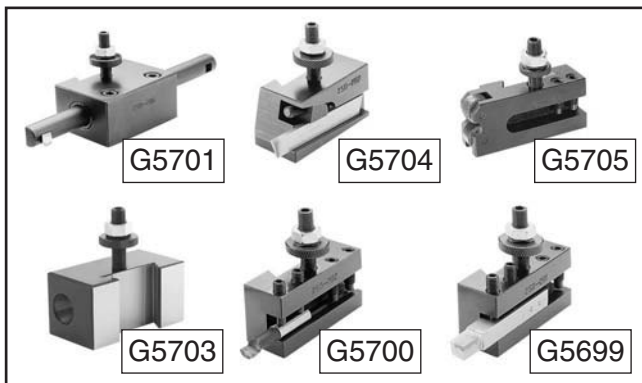


Figure 67. Quick change tool holders.

H6095—Digital Readout (DRO)

This is one of the finest DRO's on the market today. Features selectable resolution down to 5 μ m, absolute/incremental coordinate display, arc function, radius/diameter function, master reference datum, 199 user defined tools, double sealed scales, inches/millimeters and linear error compensation. Don't be fooled by our low prices—this is only a reflection of the absence of any "middlemen" in the marketing structure—not a reflection of the quality.



Figure 68. H6095 Digital Readout.

H5786—MT#3 x 4" Bull Nose Rolling Center

H5902—MT#3 x 2" Bull Nose Rolling Center

Built with precision sealed bearings, designed for heavy-duty use on hollow workpieces.



Figure 69. MT#3 bull nose rolling centers.

Call 1-800-523-4777 To Order



H5786—MT#3 Long Nose Precision Center
 Provides critical tool clearance. Adjustable thrust bearings, 60° tip and 30° clearance relief angle.

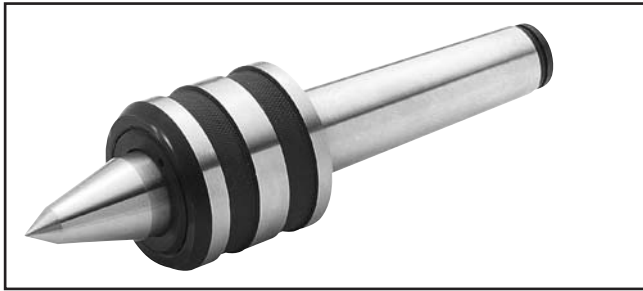


Figure 70. MT#3 Long Nose Center

G7033—Internal Threading Tool Holder
G7042—Carbide Inserts for Steel (5 pk)
G7050—Carbide Inserts for Cast Iron (5 pk)

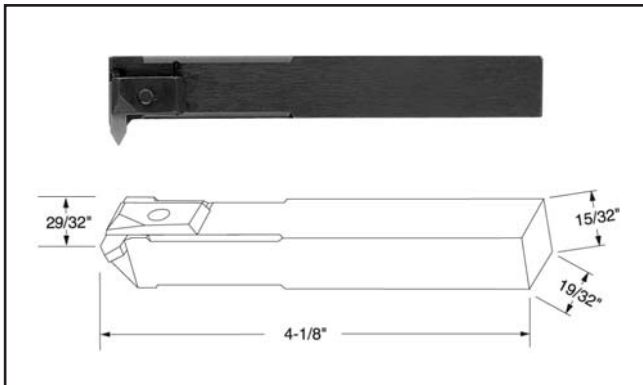


Figure 71. G7033 Int. Threading Tool Holder.

Call 1-800-523-4777 To Order

G7038Z—Boring Bar
G7040—Carbide Inserts for Steel (5 pk)
G7048—Carbide Inserts for Cast Iron (5 pk)

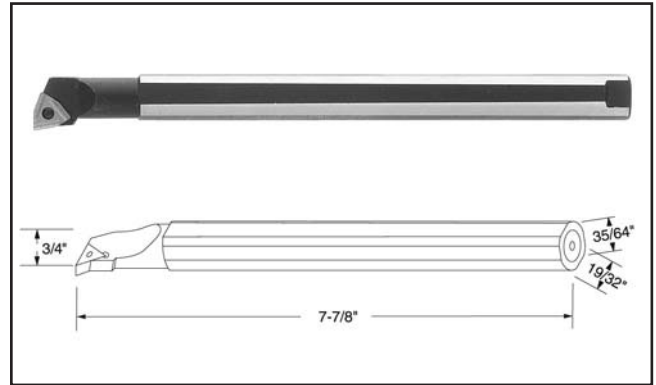


Figure 72. G7038Z Boring Bar.

G7030—Threading Tool Holder
G7041—Carbide Inserts for Steel (5 pk)
G7049—Carbide Inserts for Cast Iron (5 pk)

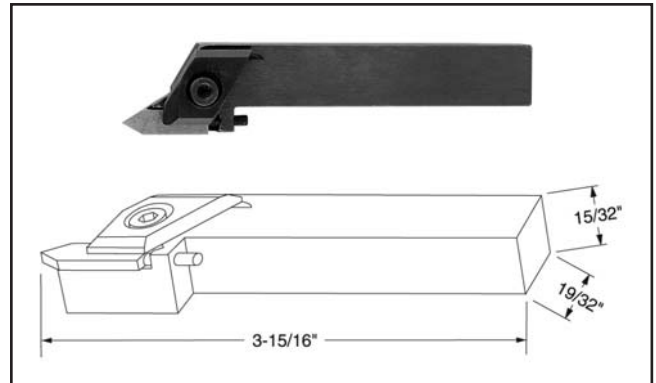
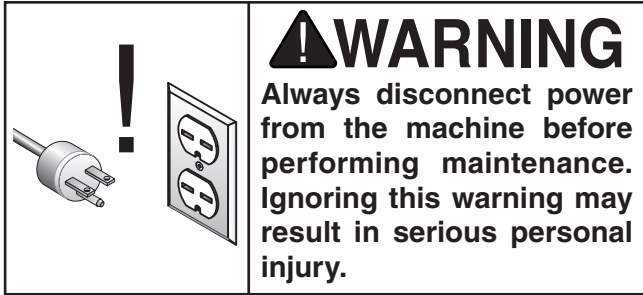


Figure 73. G7030 Threading Tool Holder.



SECTION 6: MAINTENANCE



Schedule

For optimum performance from your machine, follow this maintenance schedule and refer to any specific instructions given in this section.

Every 6–8 Hours of Running Time:

- Clean/vacuum lathe.
- Wipe down unpainted cast iron, including leadscrew, with way oil or other quality metal protectant.
- Lubricate ball fittings (**Page 43**).
- Check oil reservoirs (**Page 44**).

Weekly:

- Check coolant system (**Page 46**). Clean tank and replace cutting fluid as necessary.

Monthly:

- Check/adjust V-belt tension (**Page 44**).

Bi-Annually

- Check machine ways to ensure they are level; adjust mounting if necessary to level machine (**Page 16**).

Yearly:

- Change oil in headstock, gearbox and apron (**Page 45**).
- Check brake thickness of brake pads (**Page 56**).

Cleaning

Cleaning the Model G9036 is relatively easy. Disconnect the lathe before cleaning it. Remove chips as they accumulate. Vacuum excess metal chips and wipe off the remaining coolant with a dry cloth when finished for the day. Chips left on the machine soaked with water based coolant will invite oxidation and gummy residue to build up around moving parts. Preventative measures like this will help keep your lathe running smoothly. Always be safe and responsible with the use and disposal of cleaning products.

Unpainted Cast Iron

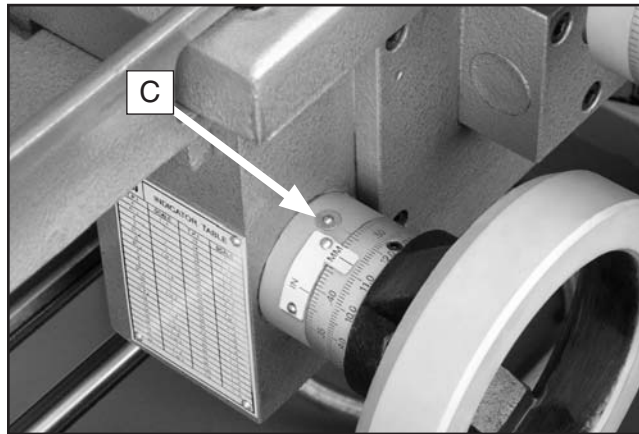
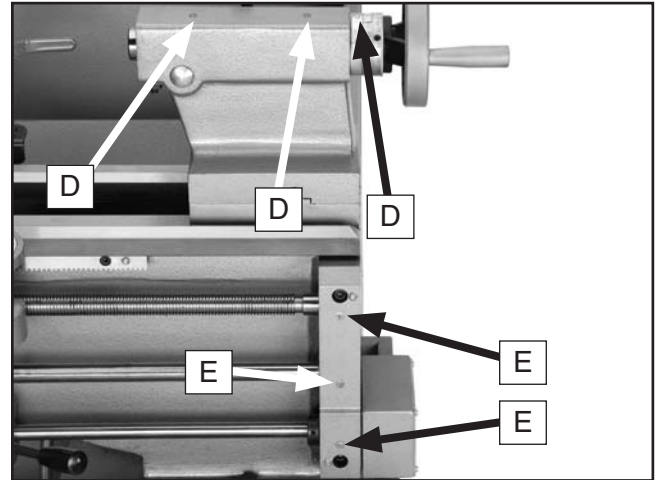
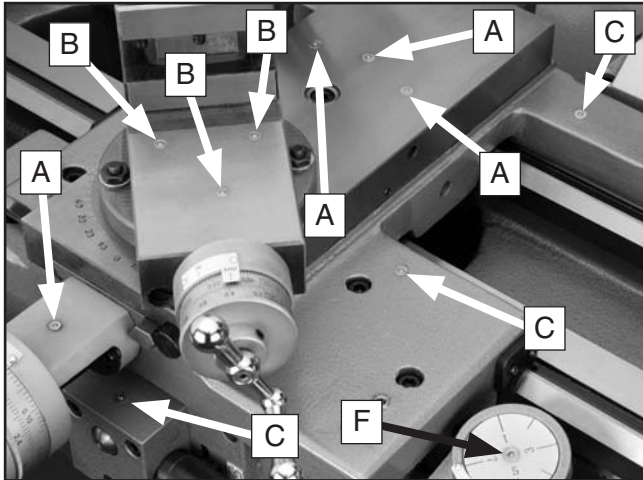
Protect the unpainted cast iron surfaces on the lathe by wiping them clean after every use—this ensures moisture does not remain on bare metal surfaces.

Keep ways rust-free with regular applications of products like G96® Gun Treatment, or Boeshield® T-9 (see **SECTION 5: ACCESSORIES** on **Page 40** for more details).



Ball Fitting Lubrication

Wipe clean and lubricate the ball fittings with an ISO 68 or equivalent oil. To insert the oil, depress the ball with the tip of an oil can and squirt once. Copy this page and use the photos and chart below as a weekly check-off list to maintain the recommended daily lubrication of the ball fittings.



Check white boxes after lubricating fittings. Date Started:

<i>G9036 Ball Fitting Lubrication Chart</i>								
MACHINE AREA	FITTINGS (QTY)	DAYS						
		MON	TUE	WED	THU	FRI	SAT	SUN
Cross Slide	A (4)							
Compound Slide	B (3)							
Carriage Components	C (4)							
Tailstock	D (3)							
Leadscrew and Feed Rod	E (3)							
Thread Dial	F (1)							



V-Belt Tension

The V-belts must be properly tensioned to ensure proper power transmission and machine functionality. The V-belts slightly stretch with use and must be checked on a monthly basis.

Checking V-Belt Tension

1. DISCONNECT LATHE FROM POWER!
2. Remove the headstock cover.
3. Push the center of the V-belts (the mid-point between the pulleys) with moderate pressure to check the belt deflection, as shown in **Figure 74**.

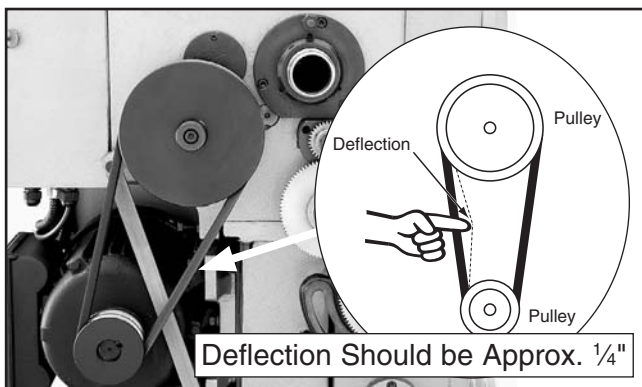


Figure 74. Checking V-belt deflection.

The V-belt deflection should be approximately $\frac{1}{4}$ ". If the deflection is greater than this, then the belt must be adjusted tighter.

Adjusting V-Belts

1. Follow the *Checking V-Belt Tension Steps 1-2* above.
2. Loosen the motor mount plate bolts (see **Figure 96** on **Page 55**), then make sure the motor mount plate slides up and down.
3. Push down on the motor with one hand to tension the belts, then tighten the motor mount bolts with your other hand to lock the motor in place.
4. Recheck belt deflection and readjust if necessary.

Oil Reservoirs

The headstock, gearbox, and apron have oil reservoirs that must be checked and topped off, if necessary, on a daily basis.

Checking Oil

Look at the sight glasses shown in **Figure 75** and ensure that the oil level is centered in the sight glass. If the oil level is low, add oil.

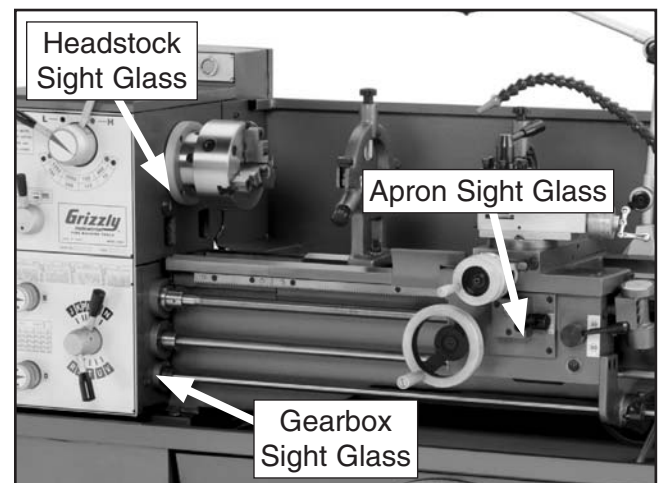


Figure 75. Location of oil reservoir sight glasses.

Adding Oil

Each reservoir has a fill and drain plug, as shown in **Figures 76–78**. The reservoirs use ISO 68 or an equivalent gear oil.

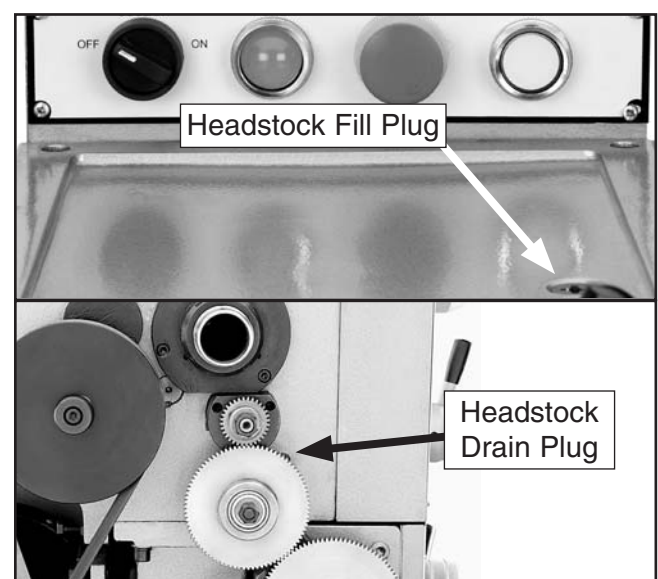


Figure 76. Headstock fill and drain plugs.



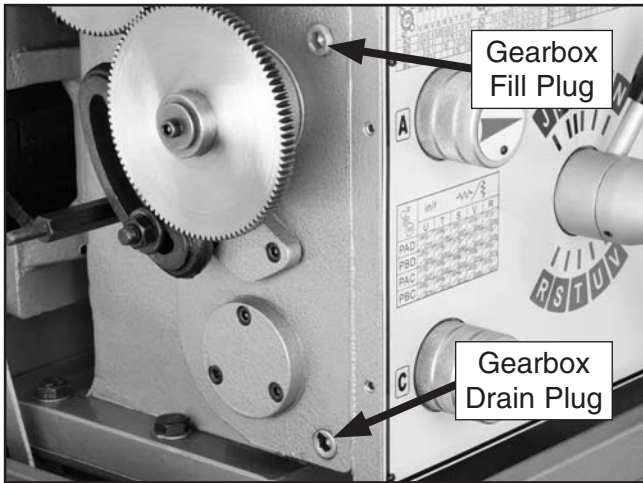


Figure 77. Gearbox fill and drain plugs.

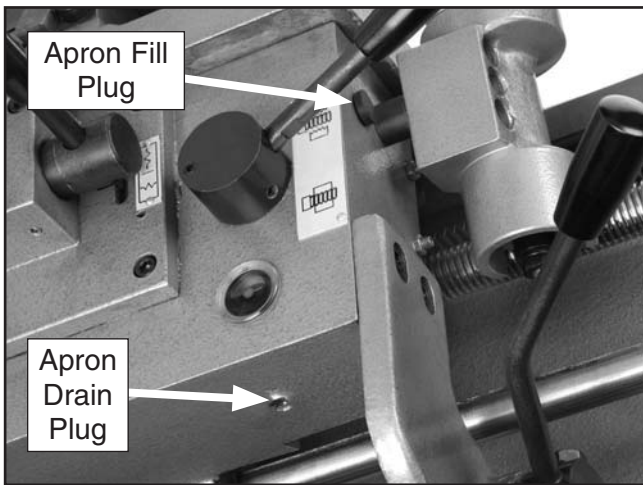


Figure 78. Apron fill and drain plugs.

To add oil to the reservoirs:

1. Wipe the area around the fill plug clean to prevent debris from falling in reservoir when adding oil.
2. Remove the fill plug.
3. Slowly add oil until the oil level is centered in the sight glass.
4. Replace fill plug.

Changing Oil

The oil in the reservoirs must be changed after the first three months of operation, then annually after that. Use an ISO 68 or equivalent gear oil.

Reservoir	Approximate Volume
Headstock.....	2.33 Quarts
Gearbox.....	1.16 Quarts
Apron.....	0.58 Quarts

NOTICE

Failure to follow lubrication guidelines will lead to rapid deterioration of lathe components.

Tools Needed	Qty
Drain Pan (at least 2 Gallon Capacity).....	1
Hex Wrench 5mm.....	1
Hex Wrench 6mm.....	1

To change the oil in the reservoirs:

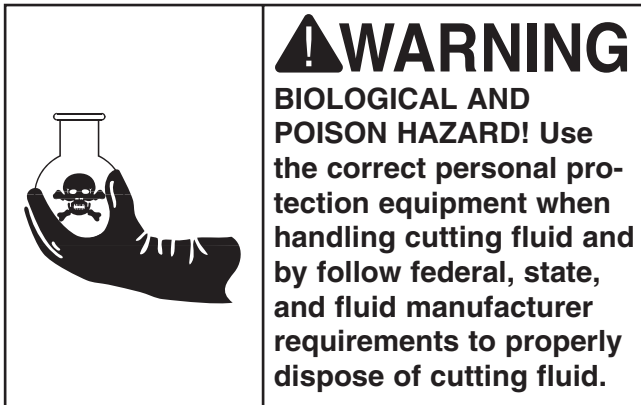
1. DISCONNECT LATHE FROM POWER!
2. Remove the headstock cover.
3. Remove the fill plug from the headstock oil reservoir (**Figure 76**).

Note: *If, for some reason, you cannot remove the fill plug, do not remove the drain plug, until you can get the fill plug out.*

4. Hold the drain pan under the headstock drain plug, then remove the drain plug (**Figure 76**) and allow the oil to completely drain into the pan.
5. While holding the drain pan under the drain hole, pour approximately a ½ quart of clean oil into the reservoir to flush out any sediment along the bottom.
6. Re-install the drain plug and add oil to the headstock reservoir until the oil level is in the center of the sight glass.
7. Re-install the fill plug.
8. Repeat **Steps 3–7** with the gearbox and apron oil reservoirs, using **Figures 77 & 78** to locate the fill and drain plugs.



Coolant System



A screen keeps large swarf under the bed where it can be removed during daily cleaning. However, smaller swarf washes down into the coolant tank where it is separated from the pump by a wall inside the reservoir. If this swarf builds up higher than the wall, then it washes into the pump chamber and clogs the pump.

In addition, cutting fluid eventually becomes rancid or contaminated, which makes it unsuitable for further use.

Checking Coolant System

When checking the coolant system, the goal is to make sure there is enough cutting fluid, the swarf level in the first chamber is not too high, and the cutting fluid has not become rancid or contaminated.

To check the coolant system:

1. DISCONNECT LATHE FROM POWER!
2. Remove the cover shown in **Figure 79** from the lathe stand.

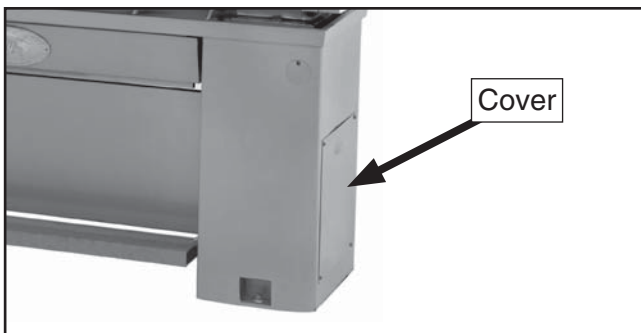


Figure 79. Coolant system cover on lathe stand.

3. Inspect the level of cutting fluid inside the tank. The cutting fluid should be approximately an inch below the top of the tank.
4. Using a flashlight, inspect the level of swarf inside the first chamber of the coolant tank. If the swarf level is beyond $\frac{3}{4}$ the height of the wall, then the tank must be cleaned (see **Figure 80**).

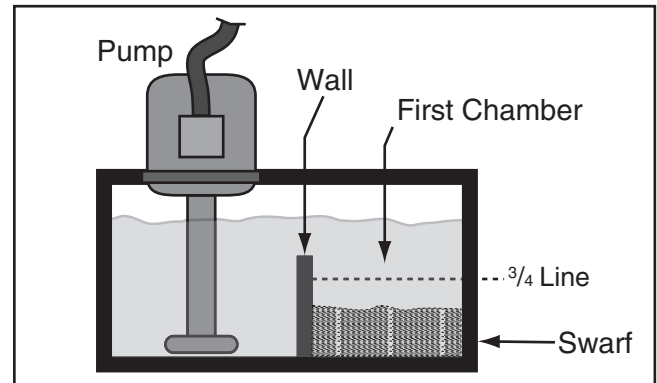


Figure 80. Diagram of coolant tank.

5. Inspect the quality of the cutting fluid by smelling it and looking at the clarity of the liquid. Cutting fluid that smells rancid or is very cloudy should be changed.

Cleaning Coolant System

1. Pump the cutting fluid into a clean container. When fluid stops coming out of the nozzle, immediately turn OFF the coolant pump so you don't burn it up by running it while dry.
2. DISCONNECT LATHE FROM POWER!
3. Remove the cover shown in **Figure 79**.
4. Pull the coolant tank out of the stand and remove the pump from the coolant tank.
5. Flush out the coolant tank and remove all swarf.
6. If necessary, clean the intake screen on the pump.
7. Re-attach the pump to the coolant tank and reinstall the coolant tank into the lathe stand.
8. If necessary, fill the coolant tank with new cutting fluid; otherwise pour the old cutting fluid back into the coolant tank.



SECTION 7: SERVICE

Troubleshooting

Review the troubleshooting and procedures in this section to fix your machine if a problem develops. If you need replacement parts or you are unsure of your repair skills, then feel free to call our Technical Support at (570) 546-9663.



Motor & Gearbox

Symptom	Possible Cause	Possible Solution
Motor will not start.	<ol style="list-style-type: none"> 1. Stop button not reset. 2. Main power panel switch is OFF. 3. Circuit breaker or fuse has tripped. 4. No voltage or open connection. 5. Capacitor is at fault. 6. Motor direction switch is at fault. 7. Power switch or magnetic contactor is at fault. 8. Motor is at fault. 	<ol style="list-style-type: none"> 1. Reset stop button. 2. Turn the main power panel switch ON. 3. Seek an electrician to troubleshoot and repair the power supply. 4. Test circuit, replace wires and connections as required. 5. Replace capacitor. 6. Replace switch. 7. Replace power switch or magnetic contactor. 8. Replace motor.
Fuses or circuit breakers trip open.	<ol style="list-style-type: none"> 1. Short circuit in line cord or plug. 2. Short circuit in motor or loose connections. 3. Incorrect fuses or circuit breakers in power supply. 	<ol style="list-style-type: none"> 1. Inspect cord or plug for damaged insulation and shorted wires. 2. Inspect all connections on motor for loose or shorted terminals or worn insulation. 3. Install correct fuses or circuit breakers.
Machine is loud belt slips when cutting. Overheats or bogs down in the cut.	<ol style="list-style-type: none"> 1. Excessive depth of cut. 2. RPM or feed rate wrong for operation. 3. Dull cutters. 4. Belt is slipping. 5. Belt is at fault. 	<ol style="list-style-type: none"> 1. Decrease depth of cut. 2. Refer to RPM feed rate chart for appropriate rates. 3. Sharpen or replace cutters. 4. Remove grease or oil on belt or pulleys/tighten belt tensioner against low range belt. 5. Replace belt.
Gear change levers will not shift into position.	<ol style="list-style-type: none"> 1. Gears not aligned in headstock. 	<ol style="list-style-type: none"> 1. Rotate spindle by hand until gear falls into place.
Loud, repetitious noise coming from machine at or near the motor.	<ol style="list-style-type: none"> 1. Pulley set screws or keys are missing or loose. 2. Motor fan is hitting the cover. 	<ol style="list-style-type: none"> 1. Inspect keys and set screws. Replace or tighten if necessary. 2. Tighten fan or shim cover, or replace items.
Motor is loud when cutting. Overheats or bogs down in the cut.	<ol style="list-style-type: none"> 1. Excessive depth of cut or feed rate. 2. RPM or feed rate wrong for cutting operation. 3. Cutting tool is dull. 4. Gear setup is too tight, causing them to bind. 	<ol style="list-style-type: none"> 1. Decrease depth of cut or feed rate. 2. Refer to RPM feed rate chart for appropriate rates. 3. Sharpen or replace the cutting tool. 4. Readjust the gear setup with a small amount of backlash so the gears move freely and smoothly when the chuck is rotated by hand.



Troubleshooting



Operation and Work Results

Symptom	Possible Cause	Possible Solution
Entire machine vibrates excessively upon startup and while running.	<ol style="list-style-type: none"> 1. Workpiece is unbalanced. 2. Worn or broken gear present. 3. Chuck or faceplate has become unbalanced. 4. Spindle bearings at fault. 	<ol style="list-style-type: none"> 1. Reinstall workpiece so it is as centered with the spindle bore as possible. 2. Inspect gears and replace if necessary. 3. Rebalance chuck or faceplate; contact a local machine shop for help. 4. Tighten or replace spindle bearings.
Cutting tool or machine components vibrate excessively during cutting.	<ol style="list-style-type: none"> 1. Tool holder not tight enough. 2. Cutting tool sticks too far out of tool holder; lack of support. 3. Gibs are out of adjustment. 4. Dull cutting tool. 5. Incorrect spindle speed or feed rate. 	<ol style="list-style-type: none"> 1. Check for debris, clean, and retighten. 2. Reinstall cutting tool so no more than 1/3 of the total length is sticking out of tool holder. 3. Tighten gib screws at affected component. 4. Replace or re sharpen cutting tool. 5. Use the recommended spindle speed or feed rate.
Can't remove tapered tool from tailstock quill.	<ol style="list-style-type: none"> 1. Quill had not retracted all the way back into the tailstock. 2. Debris was not removed from taper before inserting into quill. 	<ol style="list-style-type: none"> 1. Turn the quill handwheel until it forces taper out of quill. 2. Always make sure that taper surfaces are clean.
Cross slide, compound rest, or carriage feed has sloppy operation.	<ol style="list-style-type: none"> 1. Gibs are out of adjustment. 2. Handwheel is loose. 3. Lead screw mechanism worn or out of adjustment. 	<ol style="list-style-type: none"> 1. Tighten gib screw(s). 2. Tighten handwheel fasteners. 3. Tighten any loose fasteners on lead screw mechanism.
Cross slide, compound rest, or carriage feed handwheel is hard to move.	<ol style="list-style-type: none"> 1. Gibs are loaded up with shavings or grime. 2. Gib screws are too tight. 3. Backlash setting too tight (cross slide only). 4. Bedways are dry. 	<ol style="list-style-type: none"> 1. Remove gibs, clean ways/dovetails, lubricate, and readjust gibs. 2. Loosen gib screw(s) slightly, and lubricate bedways. 3. Slightly loosen backlash setting by loosening the locking screw and adjusting the spanner ring at the end of the handle. 4. Lubricate bedways and handles.
Bad surface finish.	<ol style="list-style-type: none"> 1. Wrong RPM or feed rate. 2. Dull tooling or poor tool selection. 3. Too much play in gibs. 4. Tool too high. 	<ol style="list-style-type: none"> 1. Adjust for appropriate RPM and feed rate. 2. Sharpen tooling or select a better tool for the intended operation. 3. Tighten gibs. 4. Lower the tool position.
Inaccurate turning results from one end of the workpiece to the other.	<ol style="list-style-type: none"> 1. Headstock and tailstock are not properly aligned with each other. 	<ol style="list-style-type: none"> 1. Realign the tailstock to the headstock spindle bore center line.
Chuck jaws won't move or don't move easily.	<ol style="list-style-type: none"> 1. Chips lodged in the jaws. 	<ol style="list-style-type: none"> 1. Remove jaws, clean and lubricate chuck threads, and replace jaws.
Carriage won't feed, or hard to move.	<ol style="list-style-type: none"> 1. Gears are not all engaged or broken. 2. Gibs are too tight. 3. Loose screw on the feed handle. 4. Lead screw shear pin has sheared. 	<ol style="list-style-type: none"> 1. Adjust gear positions or replace. 2. Loosen gib screw(s) slightly. 3. Tighten. 4. Correct the cause of shear pin breakage, and replace shear pin.
Tailstock quill will not feed out of tailstock.	<ol style="list-style-type: none"> 1. Quill lock lever is tightened down. 	<ol style="list-style-type: none"> 1. Turn lever counterclockwise.



Cross Slide Backlash Adjustment

Backlash is the amount of play in a lead screw. It is felt when turning a handwheel in one direction, then turning it in the other direction. The distance that the handwheel moves without moving the leadscrew or attached components is the backlash.

When adjusting backlash, tighten the components enough to remove backlash, but not so much that the components bind the leadscrew, making it hard to turn. Overtightening will cause excessive wear to the sliding block and lead screw.

Tools Needed	Qty
Hex Wrench 6mm.....	1
Hex Wrench 5mm.....	1

To adjust the cross slide backlash:

1. Feed the cross slide backwards (toward the front of the machine) until it reaches the end of its travel.
2. Remove the cap screw that secures the cross slide leadscrew nut (see **Figure 81**).



Figure 81. Location of cap screw that secures the leadscrew nut.

3. Rotate the cross slide handle to feed the leadscrew nut out from under the cross slide as shown in **Figure 82**.

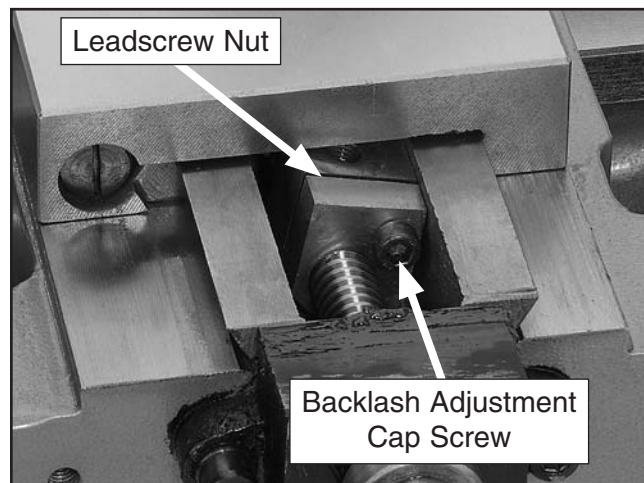


Figure 82. Leadscrew nut.

4. Tighten the backlash adjustment cap screw shown in **Figure 82** in small increments.
5. Test after each adjustment by rotating the handwheel back-and-forth until the backlash amount is acceptable.
6. Feed the leadscrew nut back under the cross slide and replace the cap screw removed in **Step 2**.



Gib Adjustments

There are three main gib adjustments for the Model G9036: the cross-slide gib, the compound slide gib and the saddle gib.

When adjusting gibs, the goal of gib adjustment is to remove unnecessary sloppiness from the movement of the slides without causing them to bind. Loose gibs may cause poor finishes on the workpiece. Over tightening may cause premature wear.

Tools Needed	Qty
Flat Head Screwdriver (Small Head)	1
Flat Head Screwdriver (Large Head).....	1
Wrench 10mm	1

Cross Slide Gib

This gib is a wedge-shaped plate that, depending on which direction it is moved, either increases or decreases pressure on the sliding components around it. **Figure 83** shows the gib components for the cross slide.

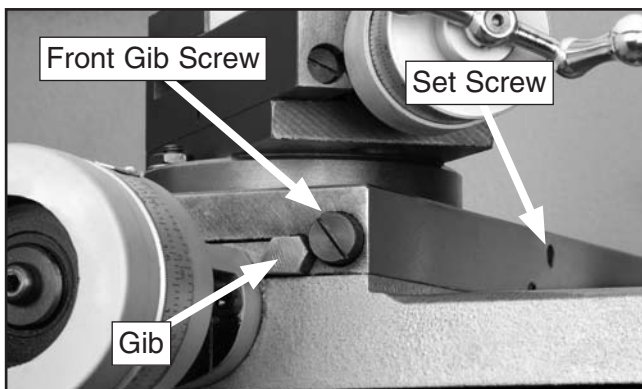


Figure 83. Cross slide gib components.

On the cross slide, moving the gib toward the back of the machine increases pressure and moving the gib toward the front of the machine decreases pressure.

The gib is moved by rotating the screws at both ends. Since these screws are at both ends, one screw must be backed away from the gib in order to move the other one toward the gib.

In addition, there is a set screw on the side of the cross slide that can be used for locking the cross slide for certain operations. This set screw must be backed out of the way before the gib can be adjusted properly.

To adjust the cross slide gib:

1. Loosen the set screw on the side of the cross slide (see **Figure 83**).
2. Loosen the gib screw at the back end of the cross slide.
3. Adjust the gib screw at the front end of the cross slide approximately an $\frac{1}{8}$ of a turn, then rotate the cross slide handwheel and notice the resistance or drag on the cross slide.
4. Repeat **Step 3** as necessary until the gib screw drag is acceptable.

Compound Slide Gib

The compound slide gib adjusts in the same manner as the cross slide gib. However, on the compound slide, moving the gib toward the adjustment handle increases pressure and moving the gib toward the tool post decreases pressure. **Figure 84** shows the gib components for the compound slide.

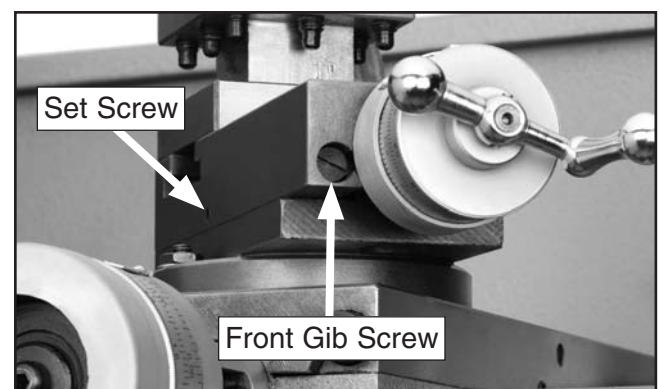


Figure 84. Compound slide gib components.



Saddle Gib

The saddle is supplied with a lock bolt on the front right-hand side of the slide (see **Figure 85**). This bolt locks the saddle in place for increased rigidity when making face cuts. Before making adjustments to the saddle gib, make sure that this bolt is loose by turning it counterclockwise one full turn.

IMPORTANT: Do not loosen the saddle lock bolt more than a couple turns or the components inside will come apart. Replacing these components is difficult and time consuming.

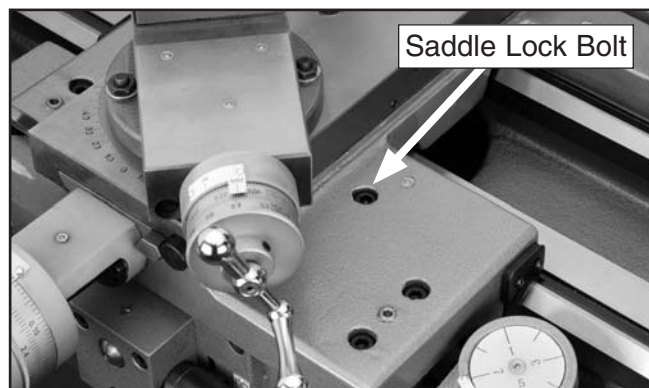


Figure 85. Location of saddle lock bolt.

The saddle gib is located on the bottom of the back edge of the slide (**Figure 86**). This gib is designed differently than the cross or compound slide gibs. Instead of being a wedge-shaped plate, it is just a flat bar. The gib tension is applied by four set screws. Hex nuts secure these set screws in place, so they will not loosen during operation.

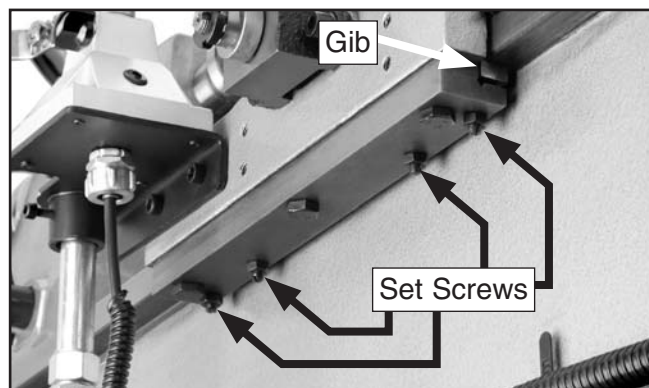


Figure 86. Saddle gib components.

To adjust the saddle gib, loosen the hex nuts and adjust the four set screws in even increments until an acceptable amount of resistance is felt when turning the carriage handwheel. Tighten the hex nuts when done, but do not allow the set screws to move when tightening.

Half Nut Adjustment

The half nut mechanism can be adjusted if it becomes loose from wear. The half nut is mounted in ways with a gib exerting pressure between components to reduce sloppy movement. The half nut gib is a flat bar-type gib, similar to the saddle gib, and is tensioned with three set screws.

Tools Needed	Qty
Hex Wrenches 2.5, 6mm.....	1 Each
Wrench 8mm	1

To adjust the half nut:

1. DISCONNECT LATHE FROM POWER!
2. Open the half nut and remove the thread dial.
3. Loosen the hex nuts on the set screws.
4. Tighten each set screw (**Figure 87**) in approximately an $\frac{1}{8}$ of a turn, then retighten the hex nuts without moving the set screws.

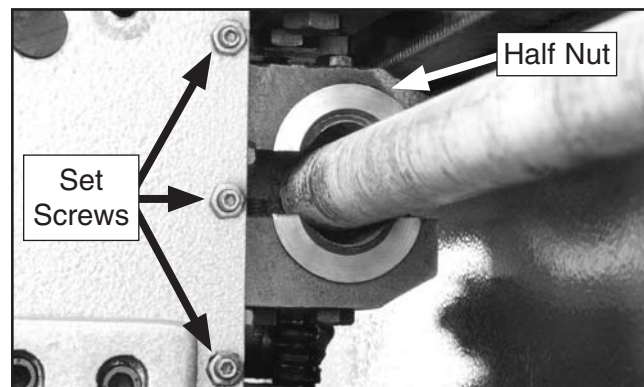


Figure 87. Half nut gib set screws.

5. Move the carriage handwheel until the half nut can fully close, then open/close the half nut several times and notice how it feels.

The half nut is correctly adjusted when you feel a slight drag while opening and closing it. The movement should not be too stiff or too sloppy.

6. Repeat **Steps 3–5**, if necessary, until you are satisfied with the half nut adjustment, then re-install the thread dial.



Shear Pin Replacement

The Model G9036 is shipped with two extra shear pins. The shear pins hold the leadscrew and feed rods together (see **Figure 88**). They are designed to break and protect more expensive components if you crash your carriage or take too large of a cut.

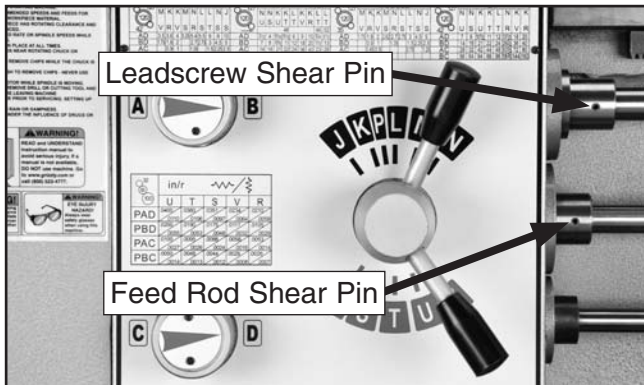


Figure 88. Shear pins.

Tools Needed	Qty
Hammer.....	1
Punch 5/16" or 8mm.....	1

To replace the shear pin:

1. DISCONNECT LATHE FROM POWER!
2. Rotate the leadscrew/feed rod so the shear pin is facing up and down. If the collar rotates independently, then rotate it so the shear pin holes align with those in the leadscrew/feed rod.
3. Use the punch and hammer to drive out the pieces of the old shear pin.
4. Make sure the holes in the collar and leadscrew/feed rod are aligned and tap the new shear pin, taper-side first, all the way into the holes.

Bearing Preload

This lathe is shipped from the factory with the spindle bearing preload adjusted. If the spindle ever develops a bit of end-play and the workpiece finish suffers, you can adjust the bearing preload to remove the end-play and improve the workpiece finish.

Tools Needed	Qty
Hook-Style Spanner Wrench 68-75mm.....	1
Dial Indicator with Magnetic Base.....	1
Heavy Dead Blow Hammer.....	1
Wooden Block.....	1

To adjust the preload:

1. Run the lathe for 20 minutes on high speed to bring the lathe to a normal temperature.
2. DISCONNECT LATHE FROM POWER!
3. Remove the chuck, shift the spindle to neutral, then remove the cover from the end of the headstock to expose the outboard end of the spindle (**Figure 89**).

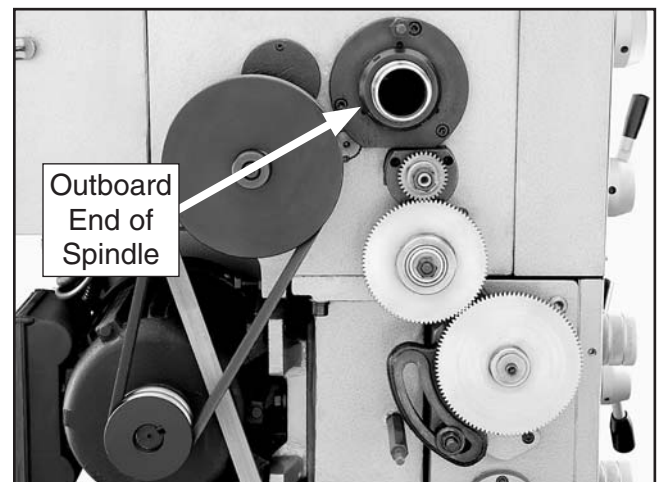


Figure 89. Location of outboard end of spindle.



- Place the chuck key in the cam-lock socket to keep the spindle from rotating, and remove the outer spanner nut shown in **Figure 90**.

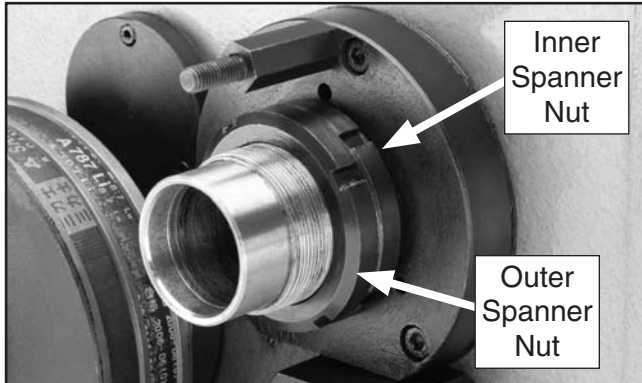


Figure 90. Spindle spanner nuts.

- Loosen the inner spanner nut one turn.

Note: You may have to tap on the outboard spindle tube as explained in **Step 7** to help unload the spindle and break the spanner nut loose.

- Place a wooden block over the outboard end of the spindle, and hit it soundly with a small sledge or heavy dead blow hammer (**Figure 91**). Your goal is to slide the spindle forward just enough to introduce spindle end-play that you can feel by hand.

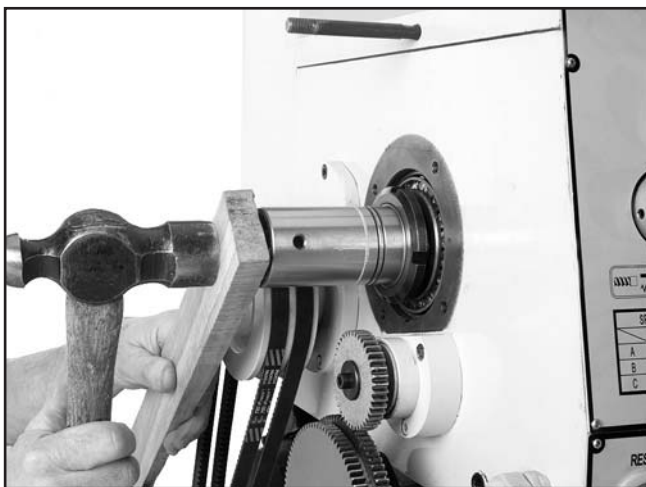


Figure 91. Introducing detectable end-play on a typical lathe.

- Place a dial indicator on the cross slide and move the carriage toward the headstock until the contact point of the indicator touches the spindle face (**Figure 92**).

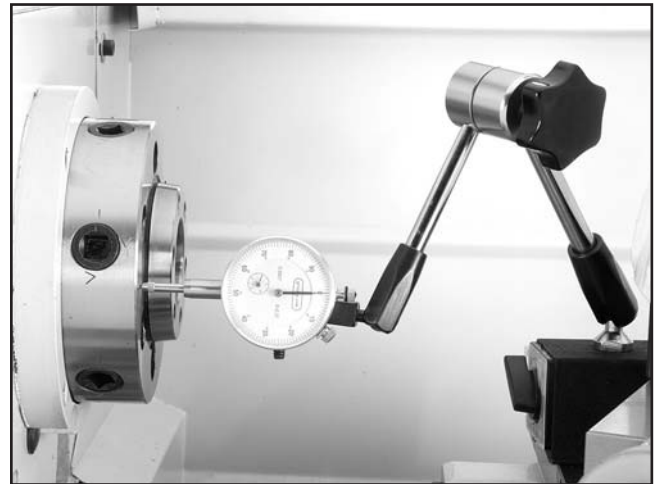


Figure 92. Dial indicator setup.

- Move the carriage an additional 0.100" toward the headstock.
- Insert the cam key into a cam socket to prevent the spindle from turning, then tighten the inner spanner nut until the dial indicator needle just stops moving (**Figure 93**).

While tightening the spanner nuts, rock the spindle back and forth slightly with the cam key to make sure the spindle tapered roller bearings seat properly in their races.

When the dial indicator needle stops moving, there will be no spindle end-play and no bearing preload. It is essential that you find this point without tightening the spanner nut too much and inadvertently preloading the spindle bearings.

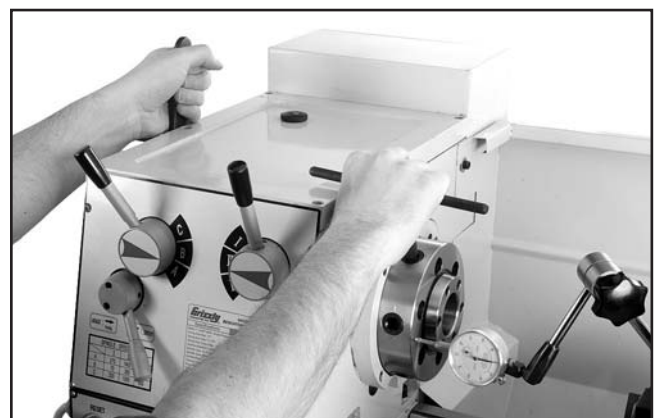


Figure 93. Adjusting spindle bearings.



Tailstock Lock

Since it takes great effort to turn the inner spanner nut, you may find it difficult to know if you have gone past the zero end-play point or not. It is easiest to have someone watch the dial while you tighten the inner spanner nut. If you think you may have gone past the zero end-play point, take the time to unload the bearings as described earlier, then re-tighten the inner spanner nut until you know you have reached the correct setting.

10. When you are confident that you have adjusted the inner spanner nut until zero spindle end-play and preload exists, tighten the spanner nut an additional $\frac{1}{16}$ th of a turn.
11. Without causing the inner spanner nut to tighten any farther, install and tighten the outer spanner nut against the inner nut.

Do not overtighten the outer spanner nut because additional preload can force the bearings even tighter against the races in the headstock and cause the headstock to compress, crack, or cause bearing failure.

To confirm that the bearings are correctly pre-loaded:

1. Reattach all removed lathe components and prepare it for operation.
2. Install the chuck and tighten the jaws.
3. Set the spindle speed to its highest setting.
4. Connect the lathe to power and turn the lathe spindle **ON**.
5. Let the lathe run for 20 minutes.
6. Turn the spindle **OFF**, disconnect lathe from power, and check the temperature of the spindle.

—If the spindle nose is slightly warm to the touch, you have correct bearing preload.

—If the spindle nose is hotter than you can comfortably keep your hand on, the preload is too tight and you must repeat bearing preload adjustment procedure. When repeating the procedure, rotate the inner spanner nut a little less during **Step 10** in the preceding instructions.

When pushed toward the spindle, the tailstock lock holds the tailstock firmly in place on the bedway with a locking plate underneath the tailstock.

Tools Needed	Qty
Wrench 17mm.....	1

To adjust the tailstock lock:

1. Move the tailstock lock down, then position the tailstock to an area on the bedway that allows access to the locking hex nut and plate underneath the tailstock (see **Figure 94**).

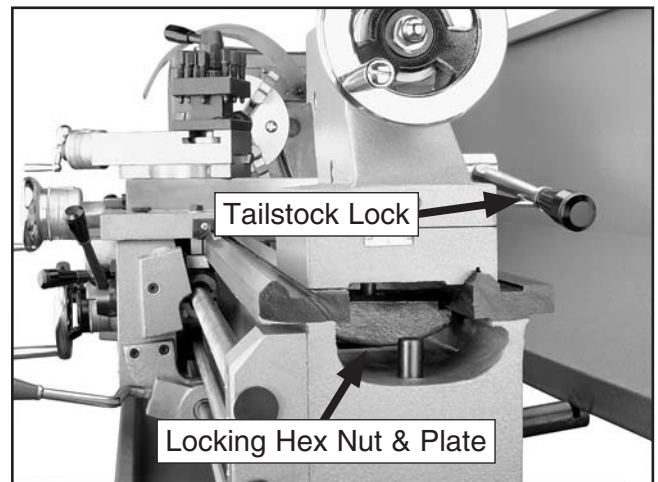


Figure 94. Tailstock locking hex nut and plate.

2. Tighten the locking hex nut a $\frac{1}{4}$ turn at a time until the tailstock will not move when locked. Repeat this step as necessary.



Gap Removal

A section of the bed called the "gap" is located just under the spindle and can be removed for turning large diameter parts or when using a large diameter faceplate.

The gap is installed, then ground, at the factory during lathe assembly for precise fit and alignment. Factors during the remaining assembly apply additional forces to the gap; therefore, replacing the gap to the original position will be very difficult. **If you choose to remove the gap, the mating surfaces of the gap will probably not sit flush with the bed if you ever re-install it. For that reason, removing the gap is considered a permanent alteration to the machine.**

Tools Needed	Qty
Hex Wrench 8mm.....	1
Heavy Dead Blow Hammer.....	1

To remove the gap:

1. DISCONNECT LATHE FROM POWER!
2. Remove the four cap screws that secure the gap to the bed (**Figure 95**).

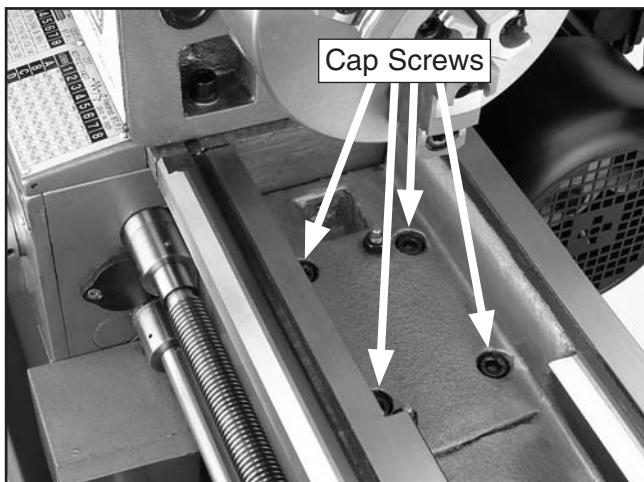


Figure 95. Gap cap screws.

3. Use the dead blow hammer to tap the gap upwards and out of the bed.

Replacing V-Belt

Tools Needed	Qty
Phillips Screwdriver #2.....	1
Wrench 17mm.....	1

To replace the V-belts on the lathe:

1. DISCONNECT LATHE FROM POWER!
2. Remove the backslash and headstock end cover.
3. Remove the tension off the old V-belts by loosening the motor mount bolts (**Figure 96**) and sliding the motor up.

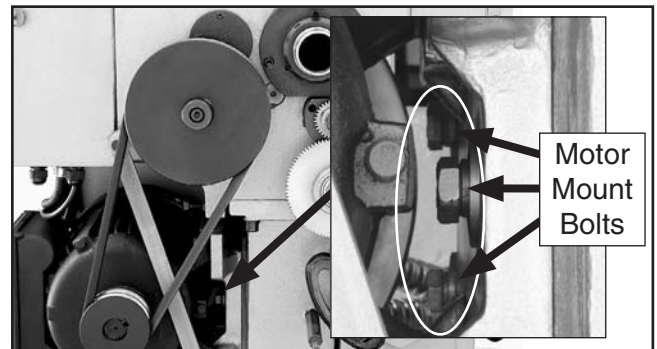


Figure 96. Location of motor mount bolts.

4. Remove the old belts and install the new ones as a matched set.
5. Push down on the motor with one hand to tension the belts, then tighten the motor mount bolts with your other hand to lock the motor in place.
6. Check the belt deflection as shown in **Figure 97** and re-adjust if necessary. The proper deflection is approximately 1/4".
7. Replace the end cover and the backslash.

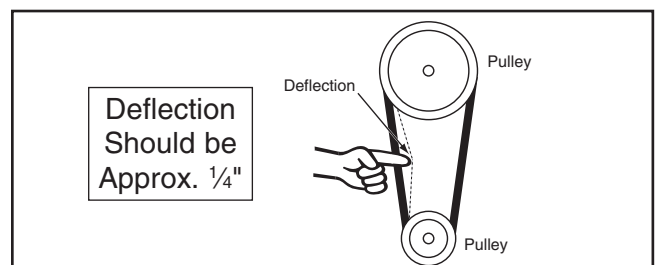


Figure 97. Belt deflection.



Brake Pads

When the brake pads are worn down to within $\frac{1}{8}$ " thick they must be replaced. If the brake pads completely wear out, then metal will grind on metal and the pulley may be ruined. When replacing the brake pads, the inside of the pulley must be turned to renew the surface as the pulley also acts as a brake drum.

Tools Needed	Qty
Phillips Screwdriver #2	1
Hex Wrench 5mm.....	1
Wrench 17mm.....	1
Needle-Nose Pliers	1
Another Lathe or Brake Turning Machine	1
Dial or Digital Calipers.....	1

To check/replace the brake pads:

1. DISCONNECT LATHE FROM POWER!
2. Remove the backsplash and headstock end cover.
3. Loosening the motor mount bolts (**Figure 96**) and remove the V-belts.
4. Step on the brake to lock the pulley in place, and remove the pulley cap screw shown in **Figure 98**. (The cap screw has normal right-hand threads and removes by turning counterclockwise.)

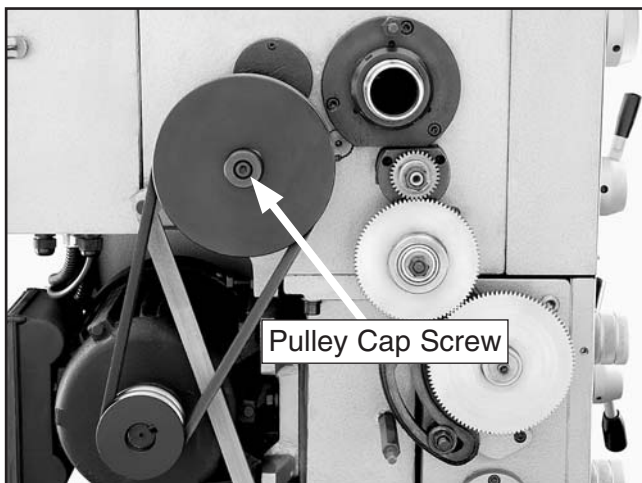


Figure 98. Pulley cap screw.

5. Step off the brake and remove the pulley. **Figure 99** shows the pulley removed and the brake pads exposed.

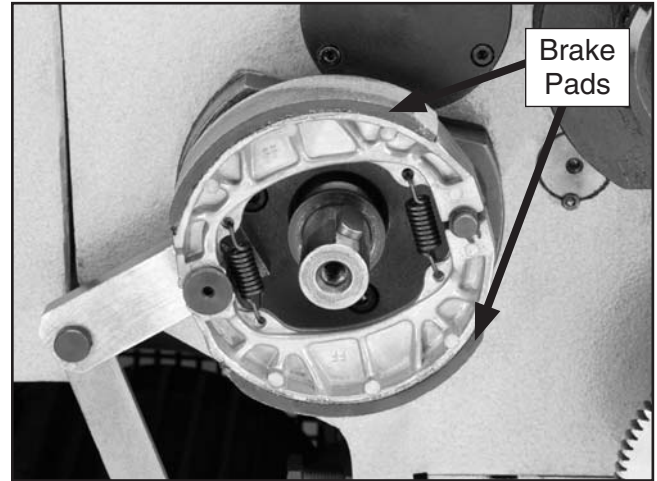


Figure 99. Brake assembly.

6. Using your calipers, measure the thickness of the brake pads.
 - If the brakes are more than a $\frac{1}{4}$ " thick, then the brake pads do not need to be changed at this time. Re-assemble the lathe in the opposite manner that you disassembled it in **Steps 2–5**.
 - If the brakes are $\frac{1}{4}$ " or thinner, then proceed to Step 7.
7. Replace the brake pads.
8. Resurface the inside of the pulley by turning off a small amount with another lathe so the inside surface is smooth and even. If you do not have access to another lathe, consider taking the pulley to a brake shop for resurfacing.
9. Install the resurfaced pulley and re-assemble the lathe in the opposite manner that you disassembled it in **Steps 2–5**.
10. Start the lathe and test the brake to make sure it works before placing the machine back into regular operation.
 - If you have any problems with the operation of the brake, feel free to call our Technical Support for help.



SECTION 8: WIRING

These pages are current at the time of printing. However, in the spirit of improvement, we may make changes to the electrical systems of future machines. Study this diagram carefully. If you notice differences between your machine and these wiring diagrams, call Technical Support at (570) 546-9663 for assistance.

⚠️ WARNING

Electrical Safety Instructions

- 1. SHOCK HAZARD.** Disconnect the power from the machine before servicing electrical components. Touching electrified parts will result in personal injury including but not limited to severe burns, electrocution, or death.
- 2. CIRCUIT REQUIREMENTS.** You **MUST** follow the **CIRCUIT REQUIREMENTS** section on **Page 11**. If you are unsure about the wiring codes in your area or you plan to connect your machine to a shared circuit, consult a qualified electrician.
- 3. GROUNDED CIRCUIT.** Electrocution or fire could result if the machine is not grounded and installed in compliance with electrical codes. Compliance **MUST** be verified by a qualified electrician.
- 4. MOTOR WIRING.** The motor wiring shown in these diagrams are current at the time of printing, but it may not match your machine. Always use the wiring diagram inside the motor junction box.
- 5. EXPERIENCING DIFFICULTIES.** If at any time you are experiencing difficulties understanding the information included in this section, contact our Technical Support at (570) 546-9663.

NOTICE

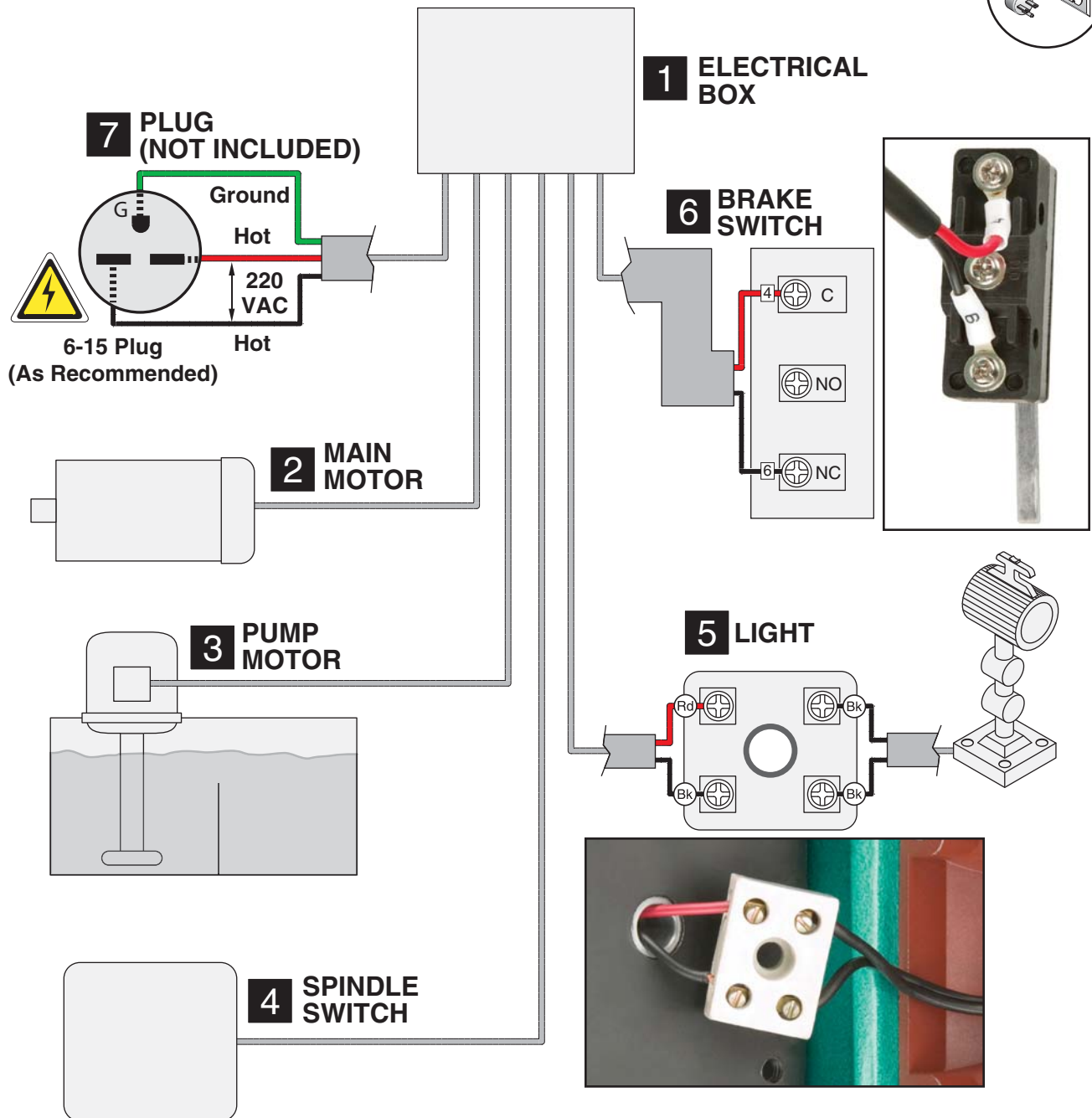
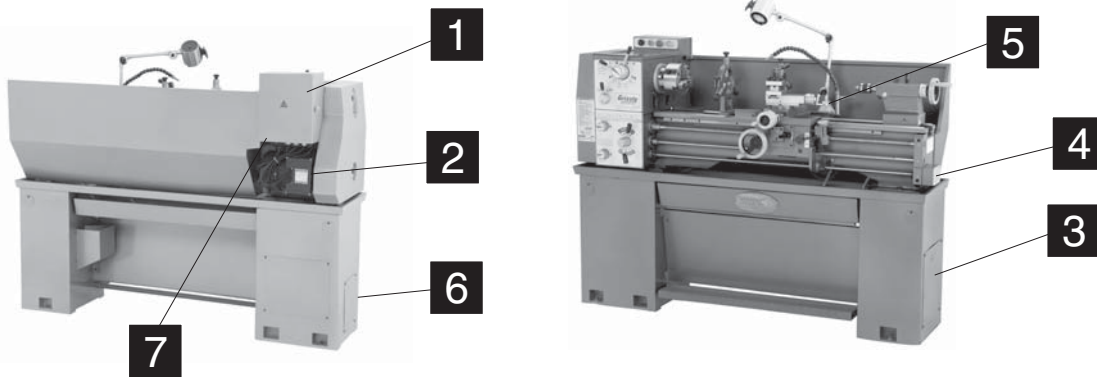
The photos and diagrams included in this section are best viewed in color. You can view these pages in color at www.grizzly.com.



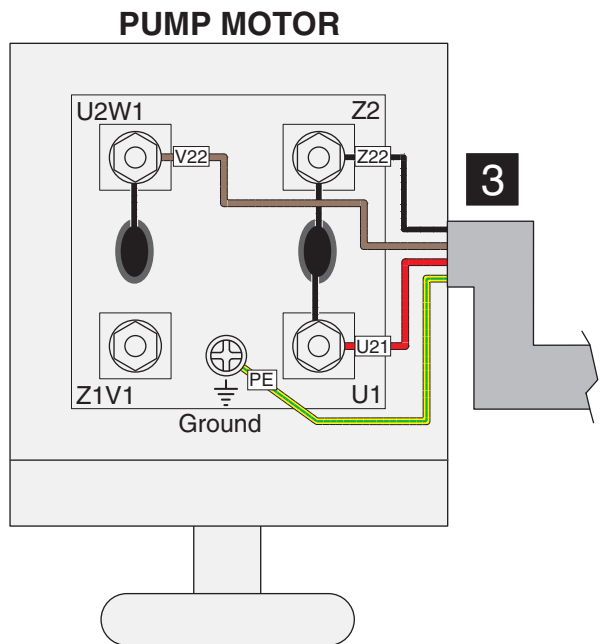
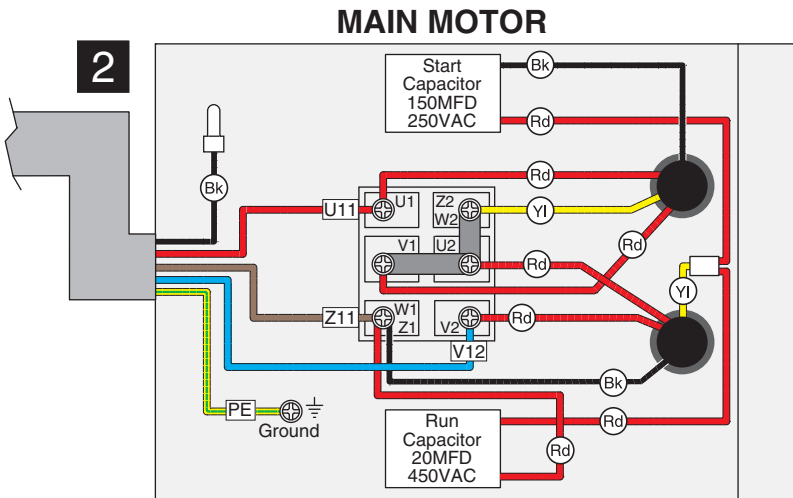
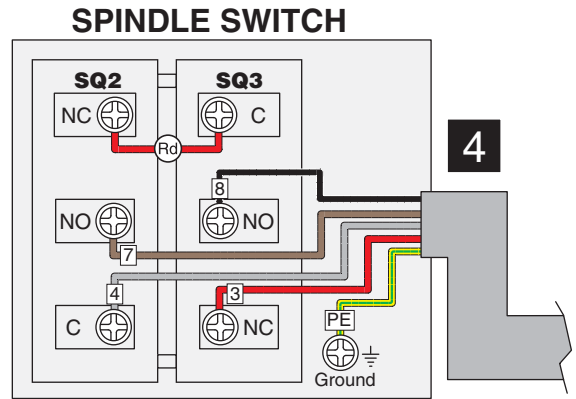
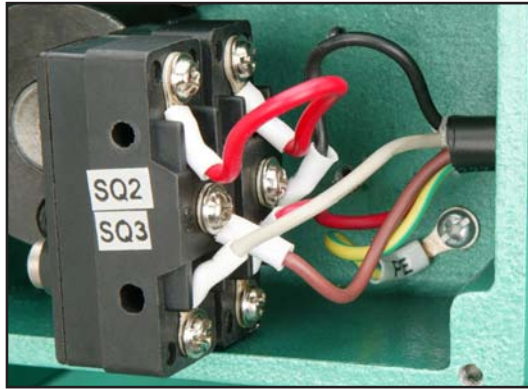
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YELLOW	
BLUE	
BROWN	
GRAY	
Grn/Ylw	



Wiring Overview

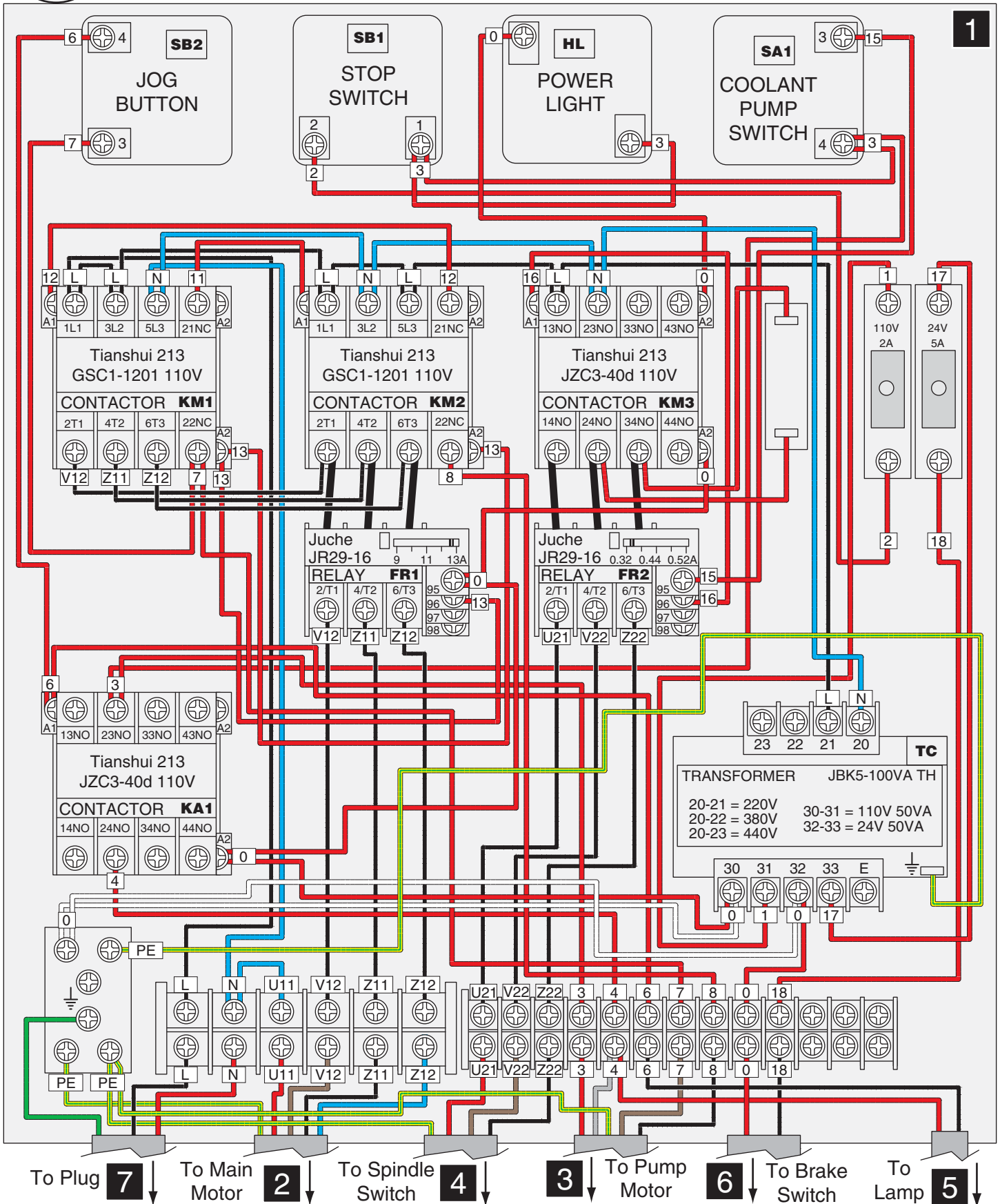


Spindle Switch, Main Motor & Pump Motor

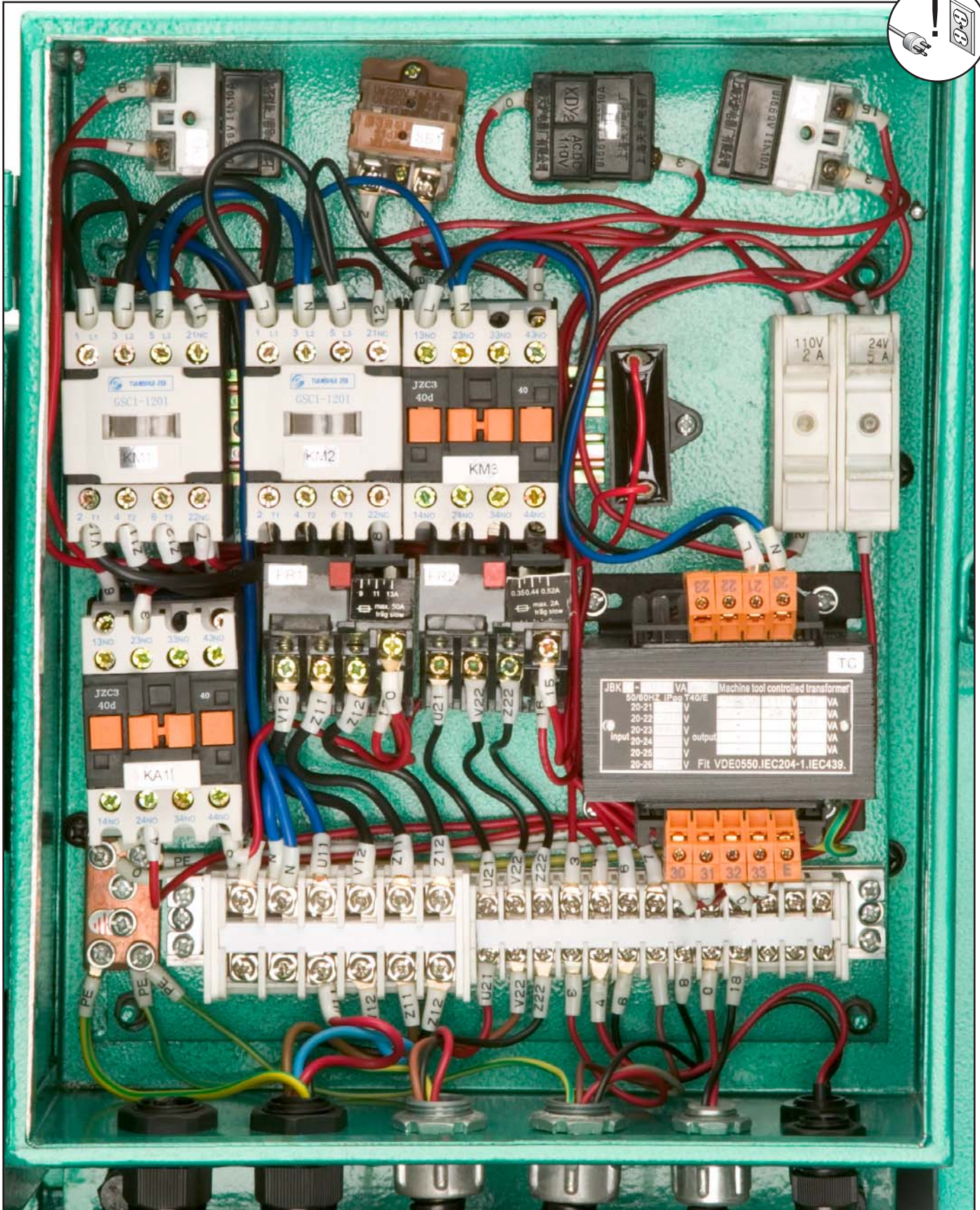




Electrical Box Wiring

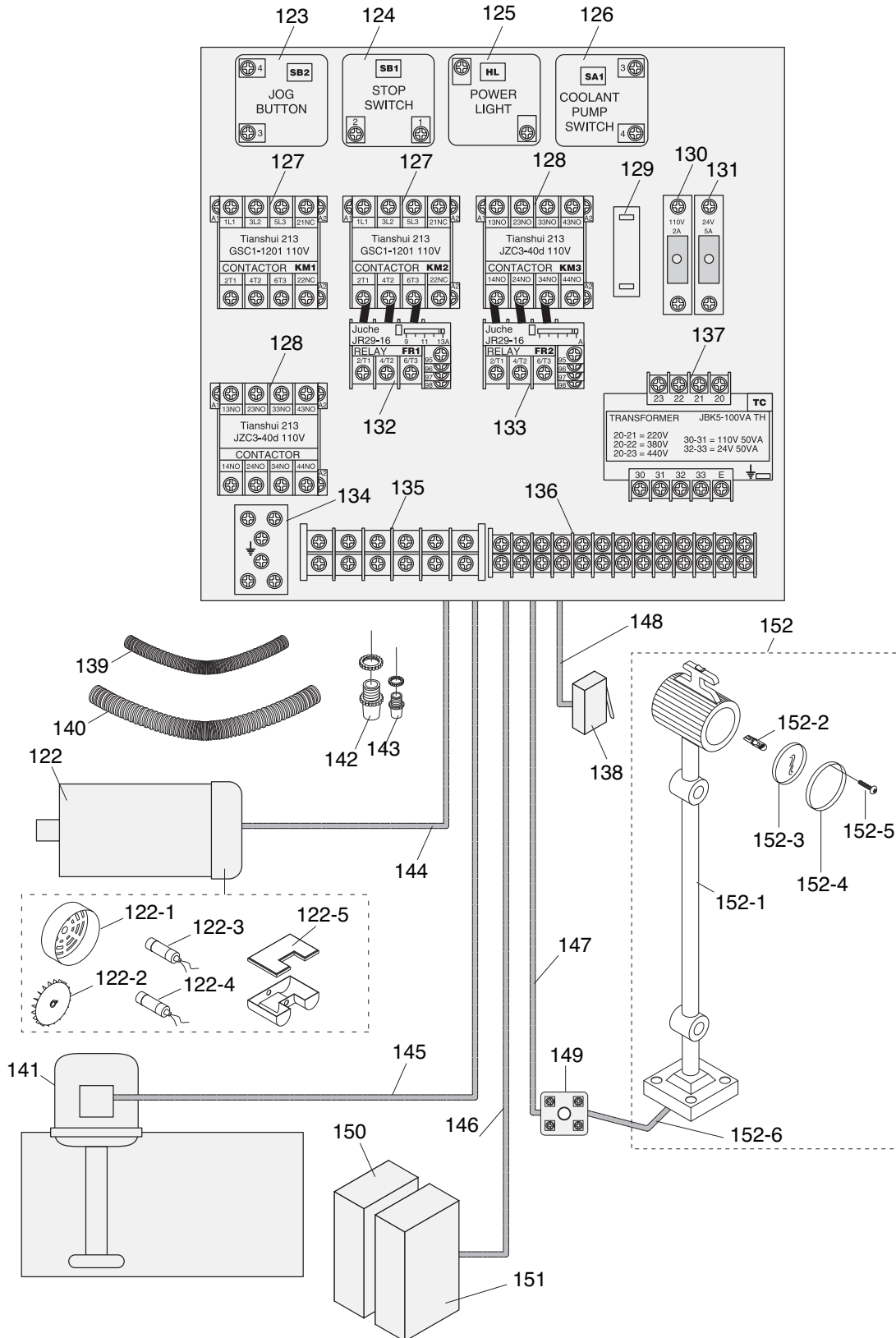


Electrical Box Photo



SECTION 8: PARTS

Electrical Breakdown



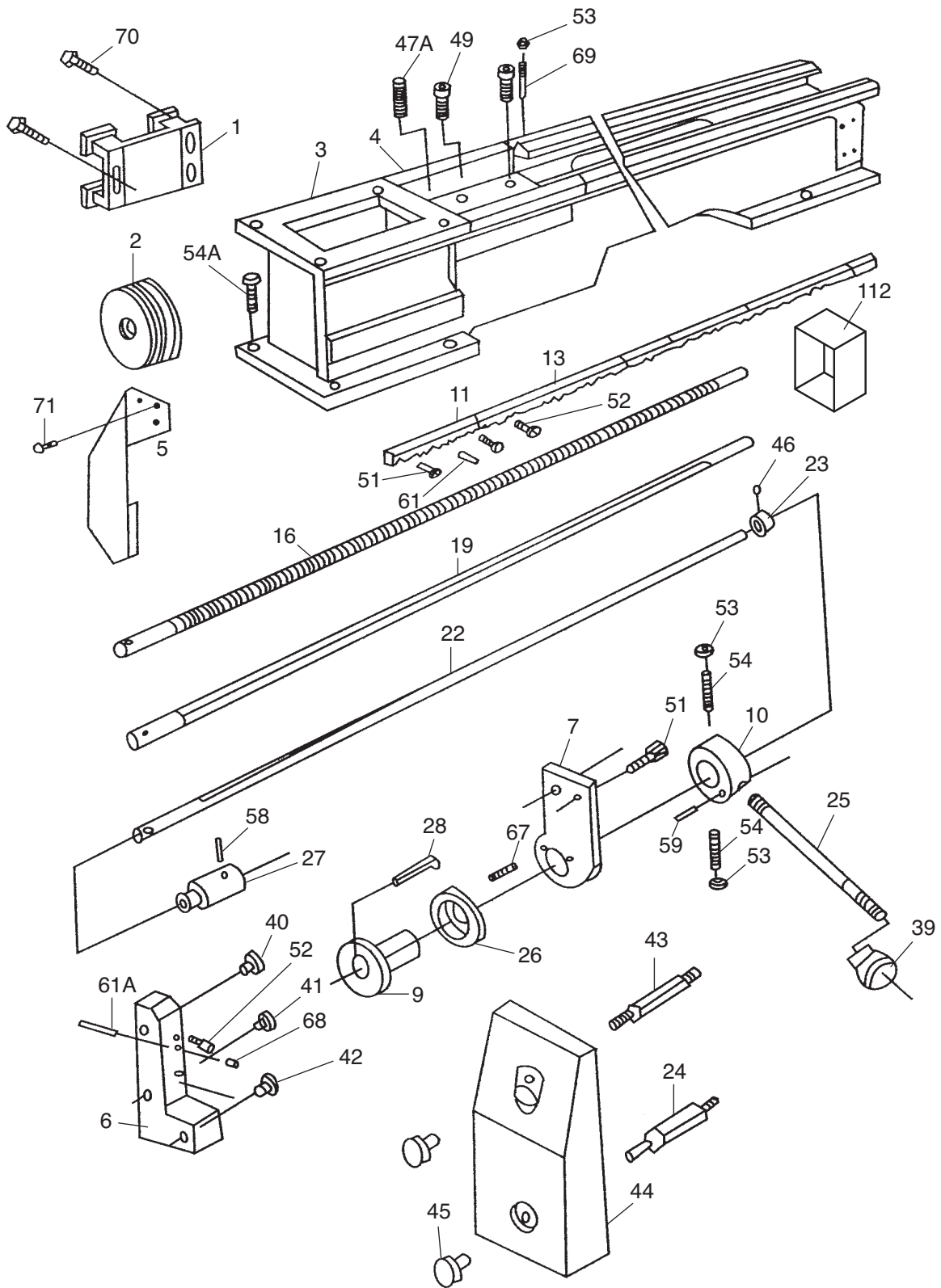
Electrical Parts List

REF	PART #	DESCRIPTION
122	P9036122	MOTOR
122-1	P9036122-1	FAN COVER
122-2	P9036122-2	FAN
122-3	P9036122-3	S CAPACITOR 150M 250V 3" X 1-1/2"
122-4	P9036122-4	R CAPACITOR 20M 450V 3" X 1-1/2"
122-5	P9036122-5	JUNCTION BOX ASSEMBLY
123	P9036123	JOG BUTTON
124	P9036124	STOP SWITCH
125	P9036125	POWER LIGHT
126	P9036126	COOLANT PUMP SWITCH
127	P9036127	CONTACTOR TIAN GSC1-1201 110V
128	P9036128	CONTACTOR TIAN JZC3-40D 110V
129	P9036129	RELAY
130	P9036130	FUSE 110V 2A
131	P9036131	FUSE 24V 5A
132	P9036132	OL RELAY JUCHE JR29-16 9-13A
133	P9036133	OL RELAY JUCHE JR29-16 0.35-0.52A
134	P9036134	GROUND BLOCK
135	P9036135	TERMINAL BLOCK 6C
136	P9036136	TERMINAL BLOCK 13C
137	P9036137	TRANSFORMER JBK5-100VA TH

REF	PART #	DESCRIPTION
138	P9036138	BRAKE SWITCH
139	P9036139	CORD COVER SMALL
140	P9036140	CORD COVER LARGE
141	P9036141	PUMP MOTOR
142	PSW04-4	STRAIN RELIEF
143	PSW04-4	STRAIN RELIEF
144	P9036144	MAIN MOTOR CORD
145	P9036145	PUMP MOTOR CORD
146	P9036146	SPINDLE SWITCH CORD
147	P9036147	LIGHT CORD
148	P9036148	BRAKE SWITCH CORD
149	P9036149	CERAMIC TERMINAL BLOCK 2C
150	P9036150	SPINDLE SWITCH
151	P9036151	SPINDLE SWITCH
152	P9036152	COMPLETE LIGHT ASSEMBLY
152-1	P9036152-1	LIGHT BODY
152-2	P9036152-2	LIGHT BULB
152-3	P9036152-3	BULB COVER
152-4	P9036152-4	BULB COVER RETAINER
152-5	PS55M	PHLP HD SCR M3-.5 X 10
152-6	P9036152-6	LIGHT BODY CORD



Bed Breakdown



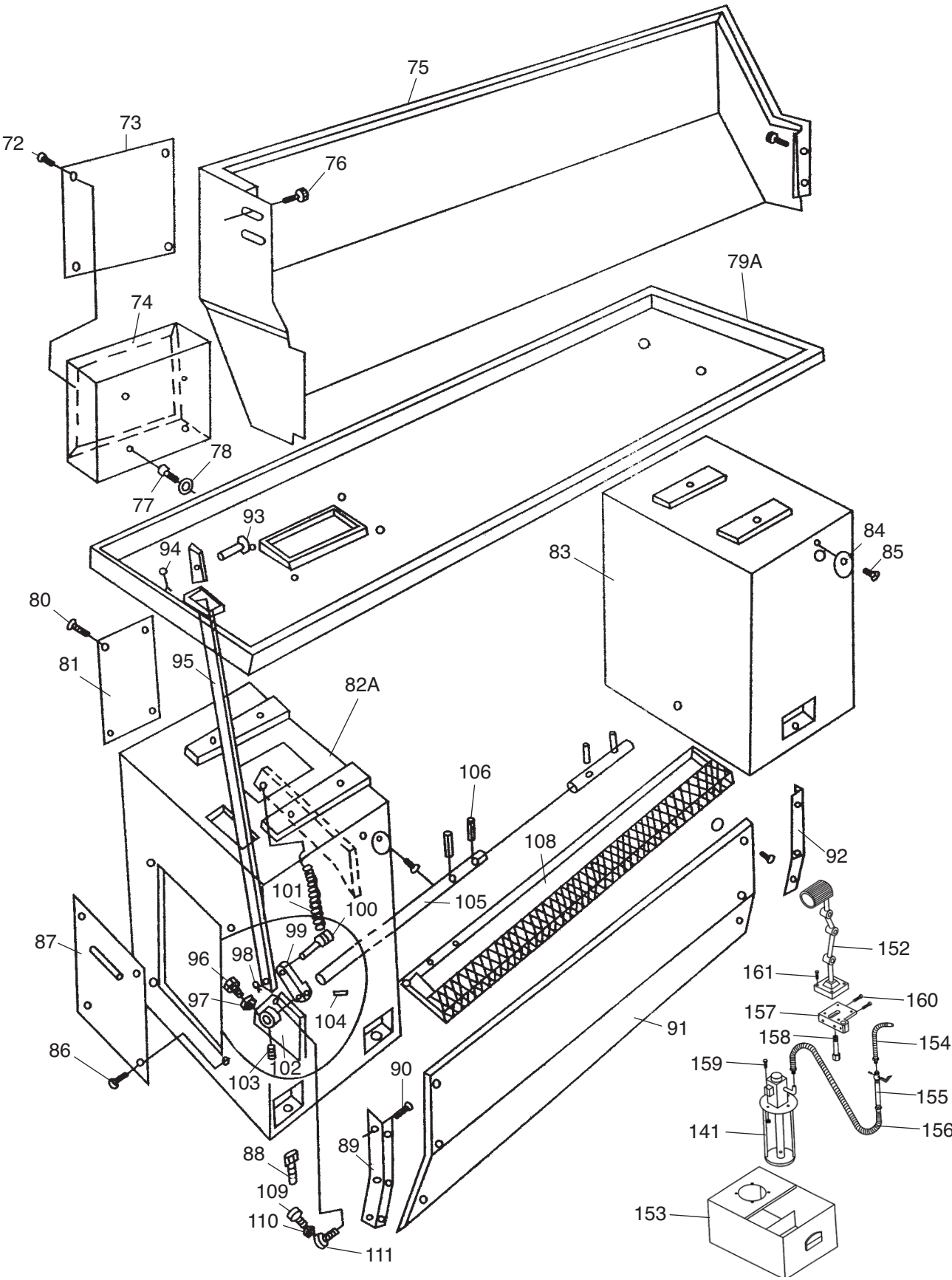
Bed Parts List

REF	PART #	DESCRIPTION
1	P9036001	MOTOR BASE
2	P9036002	PULLEY
3	P9036003	BED
4	P9036004	GAP
5	P9036005	END COVER
6	P9036006	BRACKET
7	P9036007	BRACKET
9	P9036009	COLLAR
10	P4016210	HANDLE BODY
11	P9036011	RACK (SHORT)
13	P9036013	RACK (LONG)
16	P9036016	LEAD SCREW
19	P9036019	FEED ROD
22	P9036022	SHAFT
23	P9036023	COLLAR
24	P9036024	HEX SHAFT STUD
25	P9036025	HANDLE
26	P9036026	BRAKE RING
27	P9036027	COLLAR
28	P9036028	KEY
39	PSW03-1	KNOB
40	P9036040	PLUG

REF	PART #	DESCRIPTION
41	P9036041	PLUG
42	P9036042	PLUG
43	P9036043	HEX SHAFT STUD
44	P9036044	COVER O/S
45	P9036045	KNURLED THUMB NUT
46	PSS31M	SET SCREW M5-.8 X 8
47A	PSS11M	SET SCREW M6-1 X 16
49	PSB47M	CAP SCREW M10-1.5 X 40
51	PSB02M	CAP SCREW M6-1 X 20
52	PSB60M	CAP SCREW M8-1.25 x 55
53	PN03M	HEX NUT M8-1.25
54	PSS19M	SET SCREW M8-1.25 X 30
54A	PB38M	HEX BOLT M12-1.75 X 60
58	PRP16M	ROLL PIN 3 X 25
59	P9036059	PIN 8N 6 X 25
61	PRP46M	ROLL PIN 6 X 28
61A	PRP34M	ROLL PIN 6 X 55
67	P9036067	SPRING 1 X 7.5 X 25
68	P9036068	BALL OILER 8MM
69	P9036069	STUD 8 X 60
70	PB14M	HEX BOLT M10-1.5 X 35
71	PS03M	PHLP HD SCR M6-1 X 8



Stand Breakdown



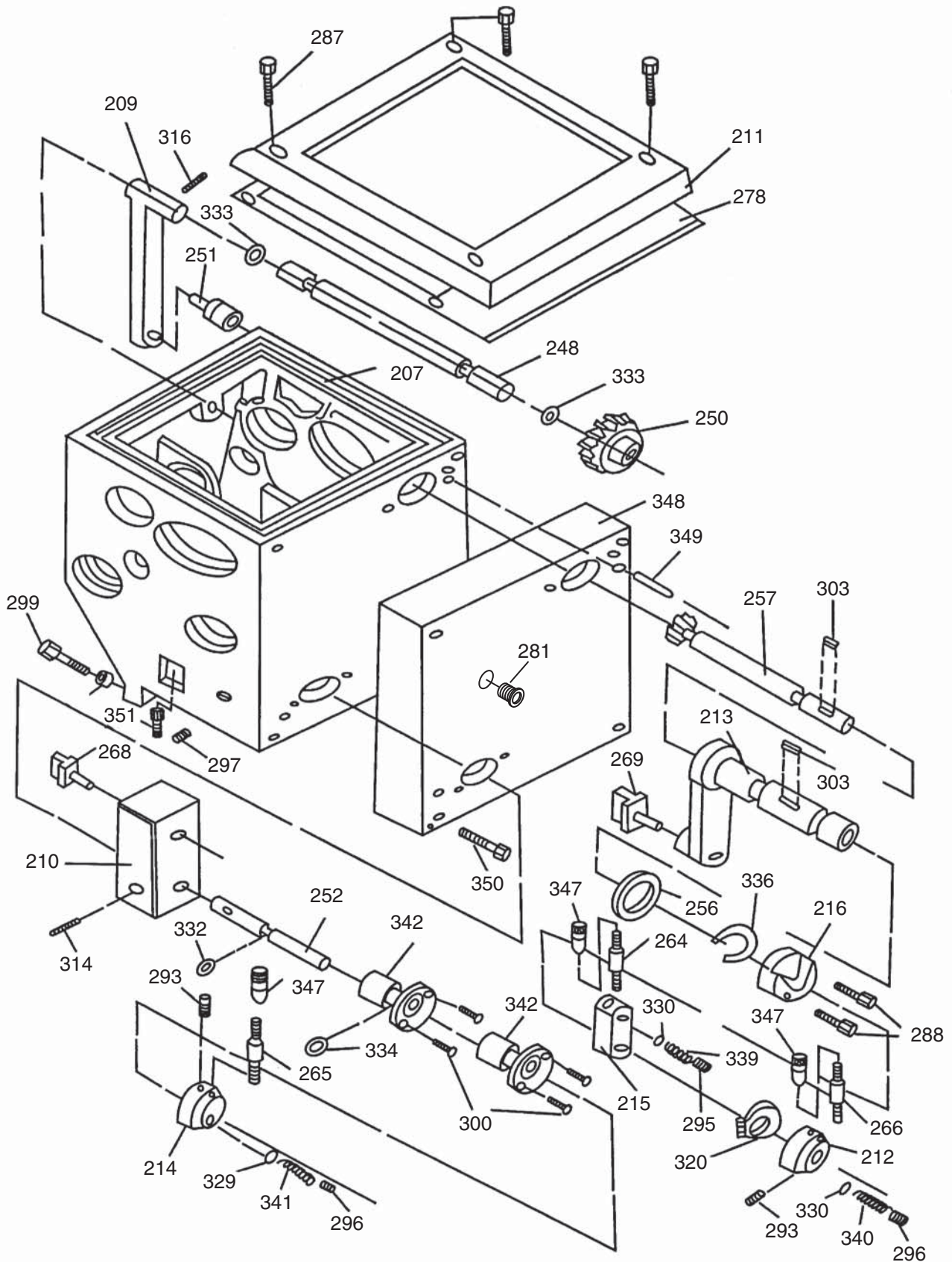
Stand Parts List

REF	PART #	DESCRIPTION
72	PS19M	PHLP HD SCR M5-.8 X 6
73	P9036114	ELECTRICAL BOX COVER
74	P9036114	ELECTRICAL BOX
75	P9036075	SPLASH GUARD
76	PSB04M	CAP SCREW M6-1 X 10
77	PSB02M	CAP SCREW M6-1 X 20
78	PN01M	HEX NUT M6-1
79A	P9036079A	OIL PLATE
80	PS68M	PHLP HD SCR M6-1 X 10
81	P9036081	COVER
82A	P9036082A	RIGHT BED STAND
83	P9036083	BED STAND
84	P9036084	COVER
85	PS68M	PHLP HD SCR M6-1 X 10
86	PS68M	PHLP HD SCR M6-1 X 10
87	P9036087	COVER
88	PB33M	HEX BOLT M12-1.75 X 50
89	P9036089	BRACKET-LEFT
90	PS68M	PHLP HD SCR M6-1 X 10
91	P9036091	PLATE
92	P9036092	BRACKET-RIGHT
93	P9036093	BREAK SHAFT
94	P9036094	SPLIT PIN
95	P9036095	BRAKE PULL ROD
96	P9036096	CAP SHAPE SCREW
97	PN02M	HEX NUT M10-1.5

REF	PART #	DESCRIPTION
98	PRP99M	ROLL PIN 2 X 12
99	P9036099	PEDAL ARM
100	P9036100	CONNECTING SHAFT
101	P9036101	DRAW SPRING
102	P9036102	SWITCH BLOCK
103	PSS20M	SET SCREW M8-1.25 X 8
104	PRP28M	ROLL PIN 5 X 40
105	P9036105	DRIVE SHAFT-LONGER
106	PRP05M	ROLL PIN 5 X 30
108	P9036108	PEDAL
109	P9036109	PHLP HD SCR M10-1.5 X 60
110	PN02M	HEX NUT M10-1.5
111	P9036111	BUTT ROD SUPPORT
112	P9036112	SWITCH BOX
141	P9036141	PUMP MOTOR
152	P9036152	COMPLETE LIGHT ASSEMBLY
153	P9036153	COOLANT TANK
154	P9036154	COOLANT NOZZLE
155	P9036155	COOLANT ON/OFF VALVE
156	P9036156	COOLANT TO TANK HOSE
157	P9036157	LIGHT MOUNTING BRACKET
158	P9036158	CONNECTION TUBE
159	PSB31M	CAP SCREW M8-1.25 X 25
160	PSB02M	CAP SCREW M6-1 X 20
161	PS15M	PHLP HD SCR M6-1 X 14



Headstock Case Breakdown



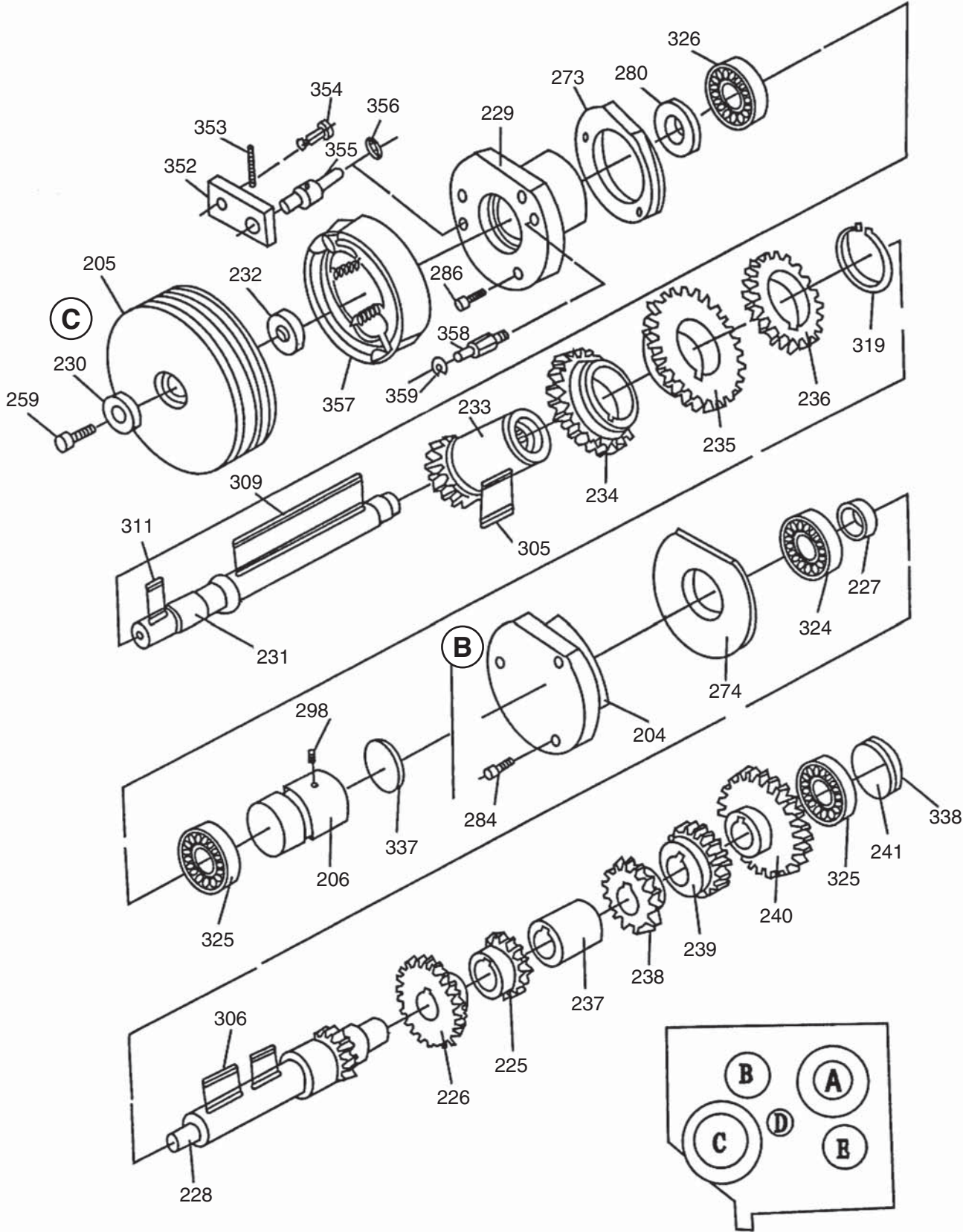
Headstock Case Parts List

REF	PART #	DESCRIPTION
207	P9036207	MAIN CASTING
209	P9036209	SHIFT LEVER
210	P9036210	SHAFT HOUSING
211	P9036211	COVER
212	P9036212	LOCK COLLAR
213	P9036213	SHAFT COLLAR
214	P9036214	HANDLE BODY
215	P9036215	HANDLE BLOCK
216	P9036216	HUB
248	P9036248	SHAFT
250	P9036250	GEAR 51T
251	P9036251	COLLAR
252	P9036252	SHAFT
256	PW23M	FLAT WASHER 30MM
257	P9036257	GEAR SHAFT 17T
264	P9036264	HANDLE
265	P9036265	HANDLE
266	P9036266	HANDLE
268	P9036268	SHIFT FORK
269	P9036269	SHIFT FORK
278	P9036278	GASKET
281	P9036281	OIL SIGHT GLASS
287	PSB14M	CAP SCREW M8-1.25 X 20
288	PSB02M	CAP SCREW M6-1 X 20
293	PSS04M	SET SCREW M6-1 X 12

REF	PART #	DESCRIPTION
295	PSS20M	SET SCREW M8-1.25 X 8
296	PSS16M	SET SCREW M8-1.25 X 10
297	PSS14M	SET SCREW M8-1.25 X 12
299	PB15M	HEX BOLT M8-1.25 X 40
300	PS07M	PHLP HD SCR M4-.7 X 8
303	PK20M	KEY 5 X 5 X 15
314	PRP01M	ROLL PIN 4 X 18
316	PRP45M	ROLL PIN 5 X 32
320	PR43M	EXT RETAINING RING 50MM
329	P9036329	STEEL BALL 6MM
330	P9036329	STEEL BALL 6MM
332	P9036332	O-RING
333	PORP014	O-RING 13.8 X 2.4 P14
334	PORP010	O-RING 9.8 X 1.9 P10
336	P9036336	SEAL 30 X 3.1MM
339	P9036339	COMPRESSION SPRING
340	P9036340	COMPRESSION SPRING
341	P9036341	COMPRESSION SPRING
342	P9036342	SHIFT HUB
347	P9036347	LEVER
348	P9036348	FRAME
349	PRP47M	ROLL PIN 6 X 60
350	PB39M	HEX BOLT M6-1 X 50
351	PSB84M	CAP SCREW M10-1.5 X 35



Headstock Gear Train Breakdown



Headstock Gear Train Parts List

REF	PART #	DESCRIPTION
204	P9036204	REAR COVER
205	P9036205	PULLEY
206	P9036206	PLUG
225	P9036225	GEAR 43T
226	P9036226	GEAR 51T
227	P9036227	SPACER
228	P9036228	GEAR SHAFT 16T
229	P9036229	COVER
230	P9036230	SPACER
231	P9036231	SHAFT
232	P9036232	SPACER
233	P9036233	COLLAR W/GEAR 21T
234	P9036234	GEAR 29T
235	P9036235	GEAR 46T
236	P9036236	GEAR 38T
237	P9036237	COLLAR
238	P9036238	GEAR 26T
239	P9036239	GEAR 34T
240	P9036240	GEAR 53T
241	P9036241	PLUG
259	PSB76M	CAP SCREW M8-1.25 X 18
273	P9036273	GASKET
274	P9036274	GASKET

REF	PART #	DESCRIPTION
280	P9036280	OIL SEAL
284	PSB23M	CAP SCREW M4-.7 X 12
286	PSB01M	CAP SCREW M6-1 X 16
298	PSS06M	SET SCREW M8-1.25 X 16
305	PK36M	KEY 5 X 5 X 50
306	PK11M	KEY 6 X 6 X 40
309	PK81M	KEY 6 X 6 X 12
311	PK34M	KEY 5 X 5 X 20
319	PR09M	EXT RETAINING RING 20MM
324	P6204	BALL BEARING 6204ZZ
325	P6203	BALL BEARING 6203ZZ
326	P6204	BALL BEARING 6204ZZ
337	PORG040	O-RING 39.4 X 3.1 G40
338	PORG045	O-RING 44.4 X 3.1 G45
352	P9036352	CONNECTING BOARD
353	PRP49M	ROLL PIN 5 X 25
354	P9036354	SHAFT
355	P9036355	BRAKE SHAFT
356	PR03M	EXT RETAINING RING 12MM
357	P9036357	BRAKE SHOES
358	P9036358	POSITIONING AXLE
359	PR39M	EXT RETAINING RING 8MM



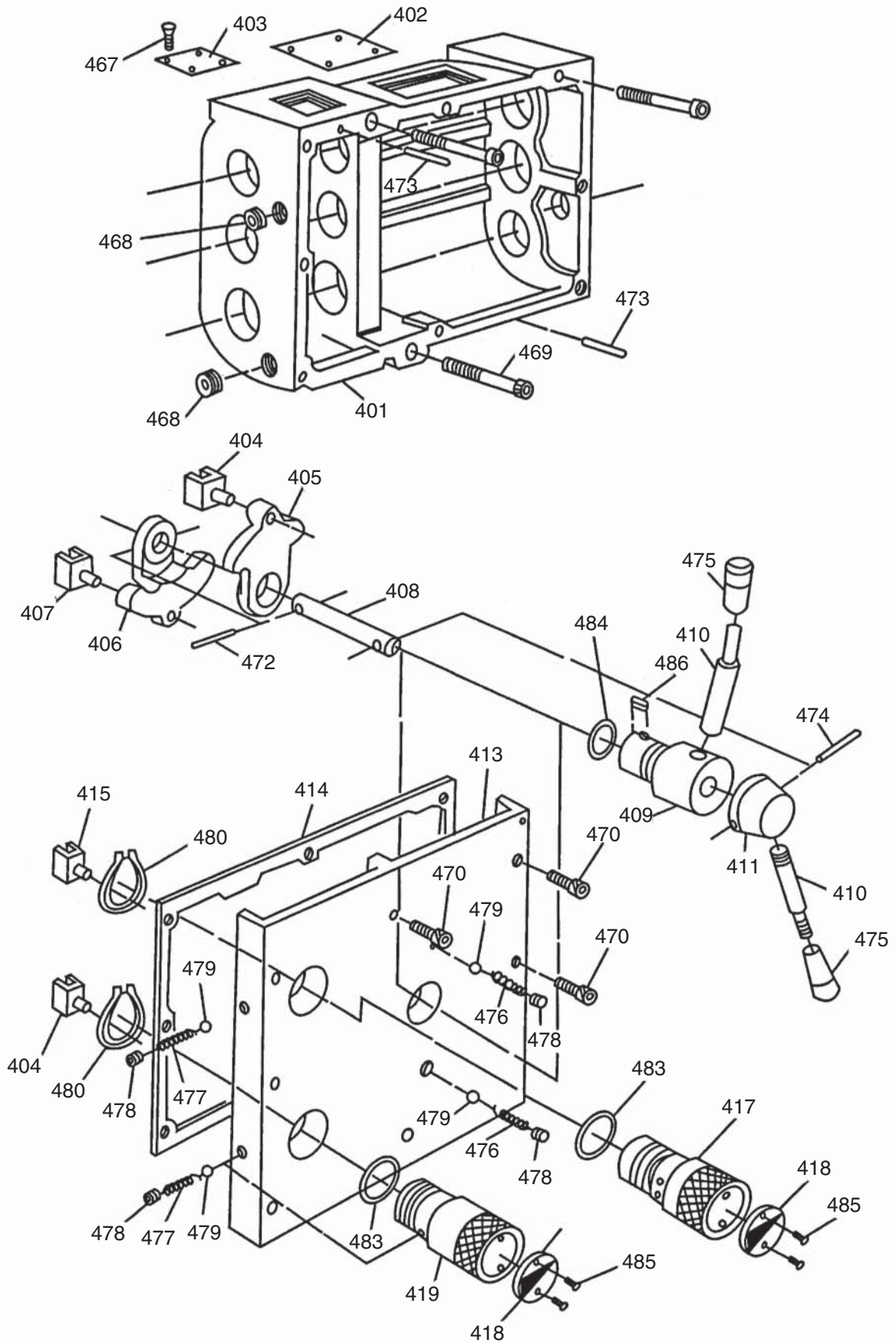
Headstock Spindle Gears Parts List

REF	PART #	DESCRIPTION
201	P9036201	COLLAR
202	P9036202	COLLAR
203	P9036203	REAR COVER
208	P9036208	FRONT COVER
217	P9036217	GEAR 37T
218	P9036218	SPACER
219	P9036219	SPACER
220	P9036220	SPACER
221	P9036221	GEAR 40T
222	PW06M	FLAT WASHER 12MM
223	P9036223	GEAR 37T
224	P9036224	LOCK RING M50-1.5
242	P9036242	GEAR 74T
243	P9036243	GEAR 37T
244	P9036244	SPINDLE
245	P9036245	SPRING
246	P9036246	PIN
247	P9036247	HANDLES- HEADSTOCK
253	P9036253	GEAR 30T
254	P9036254	SHAFT
255	P9036255	SHAFT
267	P9036267	COLLAR

REF	PART #	DESCRIPTION
275	P9036275	GASKET
276	P9036276	GASKET
277	P9036277	GASKET
279	P9036279	OIL SEAL
285	PSB24M	CAP SCREW M5-.8 X 16
287	PSB14M	CAP SCREW M8-1.25 X 20
289	PSB06M	CAP SCREW M6-1 X 25
302	PN09M	HEX NUT M12-1.75
304	PK14M	KEY 5 X 5 X 18
306	PK11M	KEY 6 X 6 X 40
307	PK49M	KEY 6 X 6 X 55
308	PK50M	KEY 6 X 6 X 120
310	PK51M	KEY 8 X 8 X 18
313	PRP44M	ROLL PIN 3 X 10
317	PR09M	EXT RETAINING RING 20MM
320	PR43M	EXT RETAINING RING 50MM
321	PR44M	EXT RETAINING RING 72MM
322	PR62M	EXT RETAINING RING 42MM
323	P6004	BALL BEARING 6004ZZ
327	P30210	TAPERED ROLLER BEARING 30210
328	P30212	TAPERED ROLLER BEARING 30212
335	PORPS025	O-RING 24.5 X 2.0 S24



Gearbox Case Breakdown



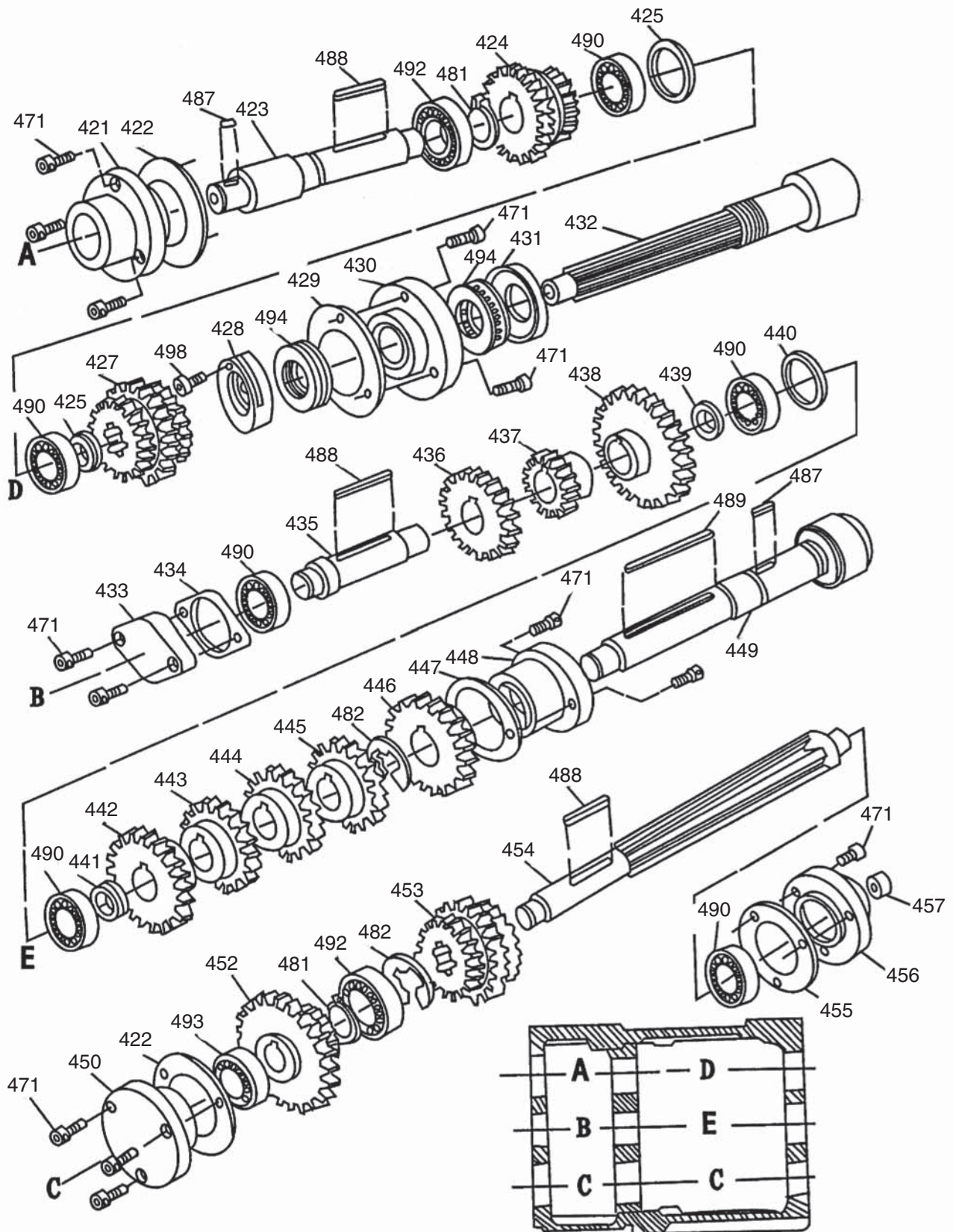
Gearbox Case Parts List

REF	PART #	DESCRIPTION
401	P9036401	CASTING
402	P9036402	RIGHT COVER
403	P9036403	LEFT COVER
404	P9036404	SLIPPER
405	P9036405	LEVER
406	P9036406	LEVER
407	P9036407	SLIPPER
408	P9036408	SHAFT
409	P9036409	HANDLE BASE (INNER)
410	P9036410	LEVER
411	P9036411	HANDLE BASE
413	P9036413	COVER
414	P9036414	GASKET
415	P9036415	SLIPPER
417	P9036417	HANDLE
418	P9036418	PLATE
419	P9036419	HANDLE

REF	PART #	DESCRIPTION
467	PS07M	PHLP HD SCR M4-.7 X 8
468	P9036468	OIL SIGHT GLASS
469	PSB66M	CAP SCREW M8-1.25 X 65
470	PSB02M	CAP SCREW M6-1 X 20
472	PRP03M	ROLL PIN 5 X 20
473	PRP28M	ROLL PIN 5 X 40
474	PRP30M	ROLL PIN 5 X 50
475	P9036475	HANDLE KNOB 10MM
476	P9036476	COMPRESSION SPRING
477	P9036477	COMPRESSION SPRING
478	PSS17M	SET SCREW M8-1.25 X 6
479	P9036479	STEEL BALL 6.5MM
480	PR68M	EXT RETAINING RING 40MM
483	PORG045	O-RING 44.4 X 3.1 G45
484	P9036484	O-RING 29.4 X 3.1 G30
485	PS79M	PHLP HD SCR M3-.5 X 8
486	PK127M	KEY 5 X 5 X 8



Gearbox Gear Train Breakdown



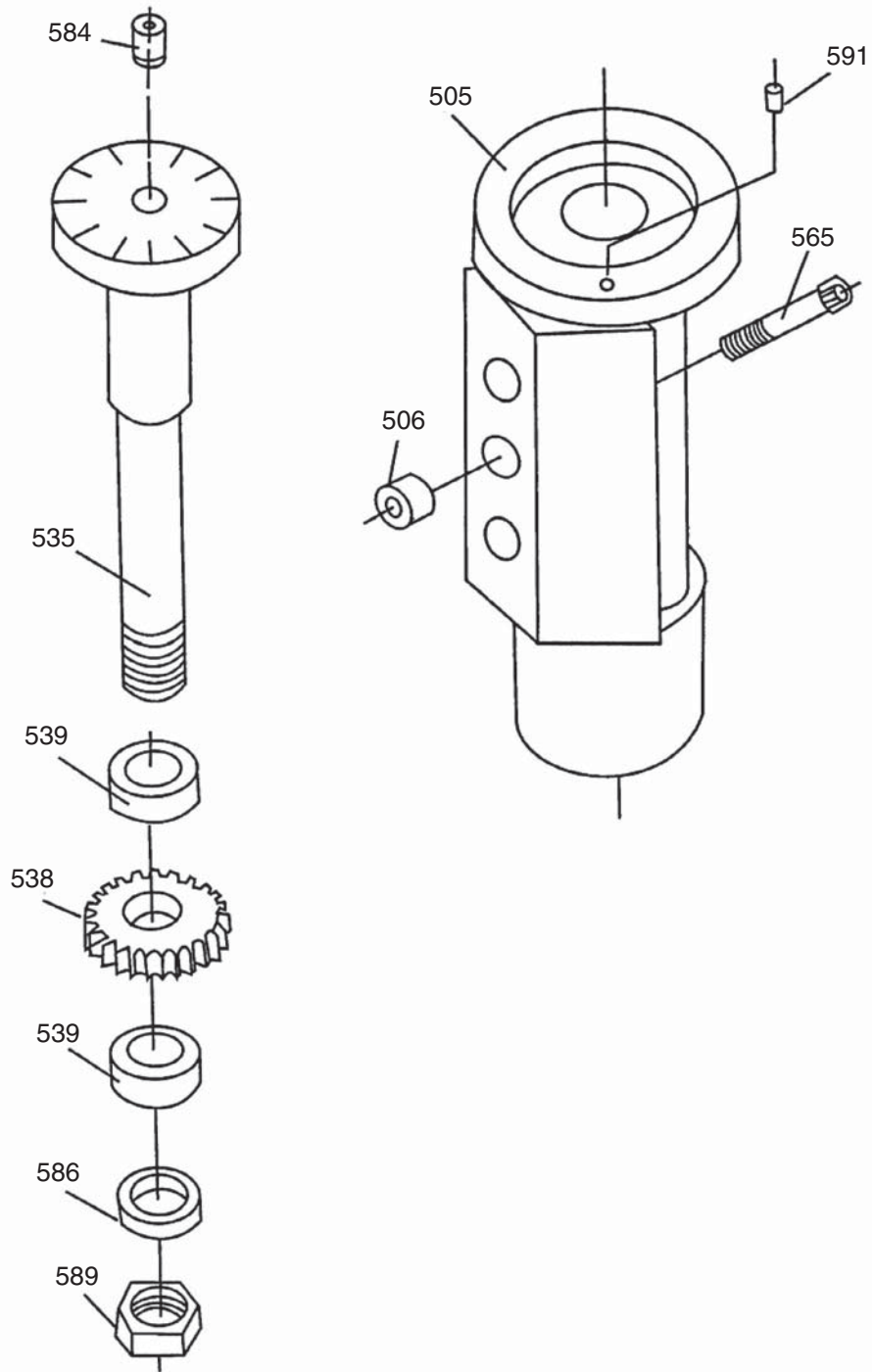
Gearbox Gear Train Parts List

REF	PART #	DESCRIPTION
421	P9036421	COVER
422	P9036422	GASKET
423	P9036423	SHAFT
424	P9036424	GEAR 20/30T 2.5M
425	P9036425	SPACER
427	P9036427	GEAR 24T X 2.25/3.25/2.5
428	P9036428	SPECIAL NUT M24-1.5
429	P9036429	GASKET
430	P9036430	BUSHING W/ HOUSING
431	P9036431	SPACER
432	P9036432	SHAFT
433	P9036433	END COVER
434	P9036434	GASKET
435	P9036435	SHAFT
436	P9036436	GEAR 30T X 2.5
437	P9036437	GEAR 20T X 2.5
438	P9036438	GEAR 40T X 2.5
439	P9036439	SPACER
440	P9036440	SPACER
441	P9036441	SPACER
442	P9036442	GEAR 40T X 2.25
443	P9036443	GEAR 24T X 3.25
444	P9036444	GEAR 22T X 3.25

REF	PART #	DESCRIPTION
445	P9036445	GEAR 21T X 3.25
446	P9036446	GEAR 36T X 2.5
447	P9036447	GASKET
448	P9036448	FLANGE
449	P9036449	SHAFT
450	P9036450	END COVER
452	P9036452	GEAR 15/30T X 2.5
453	P9036453	GEAR 18T X 2.25/3.25/2.5
454	P9036454	KEY SHAFT
455	P9036455	GASKET
456	P9036456	COVER
457	P9036457	COPPER SLEEVE
471	PSB27M	CAP SCREW M6-1 X 14
481	PR09M	EXT RETAINING RING 20MM
482	PR10M	EXT RETAINING RING 22MM
487	PK19M	KEY 5 X 5 X 14
488	PK36M	KEY 5 X 5 X 50
489	PK17M	KEY 5 X 5 X 80
490	P6202	BALL BEARING 6202ZZ
492	P9036492	BALL BEARING 6104
493	P6302	BALL BEARING 6302
494	P8105	THRUST BEARING 8105
498	PSB18M	CAP SCREW M4-.7 X 8



Thread Dial Breakdown

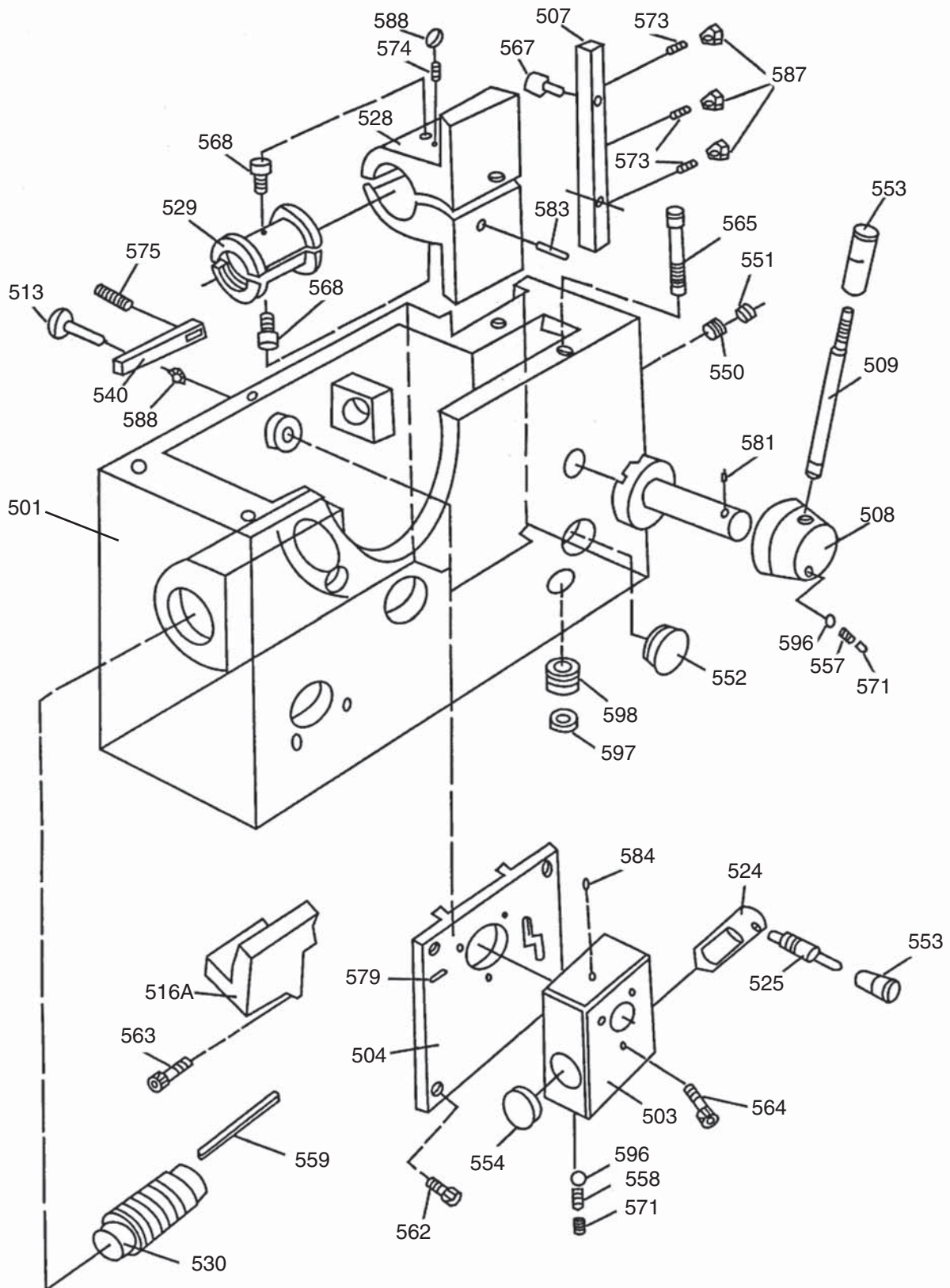


REF	PART #	DESCRIPTION
505	P9036505	THREADING DIAL BODY
506	P9036506	SPACER
535	P9036535	THREAD DIAL SHAFT
538	P9036538	GEAR 32T
539	P9036539	SPACER

REF	PART #	DESCRIPTION
565	PSB13M	CAP SCREW M8-1.25 X 30
584	P9036584	BALL OILER 8MM
586	P9036586	LOCK WASHER
589	PN03M	HEX NUT M8-1.25
591	P9036591	RIVET



Apron Case Breakdown



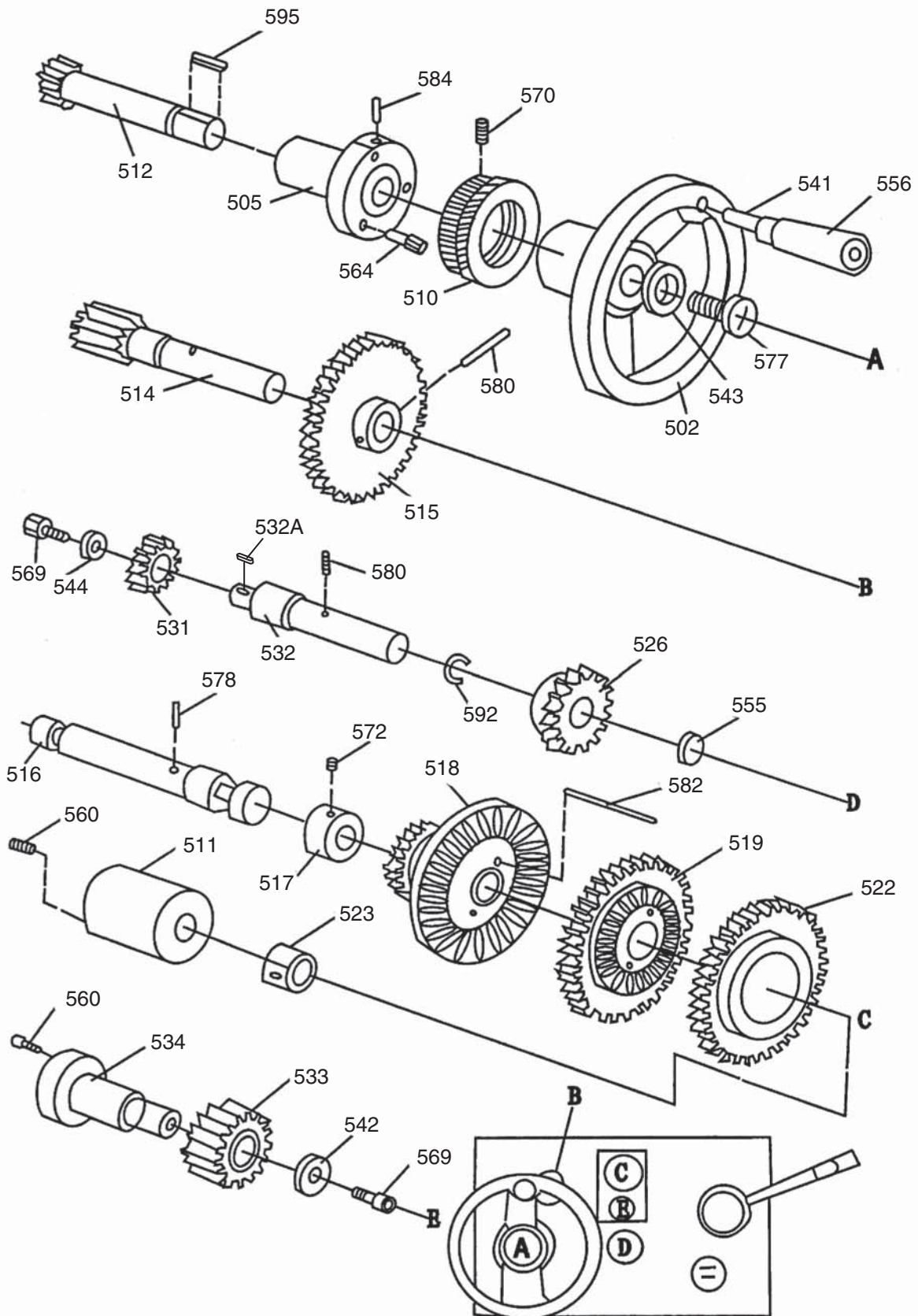
Apron Case Parts List

REF	PART #	DESCRIPTION
501	P9036501	APRON CASTING
503	P9036503	BOX
504	P9036504	COVER
507	P9036507	GIB
508	P9036508	HANDLE HUB
509	P9036509	HANDLE
513	P9036513	GEAR PIN
516A	P9036516A	BRACKET
524	P9036524	SHIFT LEVER
525	P9036525	SHIFT HANDLE
528	P9036528	BRACKET
529	P9036529	HALF NUT
530	P9036530	WORM
540	P9036540	BAR
550	P9036550	OIL SIGHT COLLAR
551	P9036551	OIL SIGHT COLLAR
552	P9036552	OIL SIGHT
553	PSW03-1	KNOB
554	P9036554	PLUG A
557	P9036557	COMPRESSION SPRING
558	P9036558	COMPRESSION SPRING

REF	PART #	DESCRIPTION
559	PK02M	KEY 5 X 5 X 40
562	PSB26M	CAP SCREW M6-1 X 12
563	PSB01M	CAP SCREW M6-1 X 16
564	PSB06M	CAP SCREW M6-1 X 25
565	PSB13M	CAP SCREW M8-1.25 X 30
567	PSB24M	CAP SCREW M5-.8 X 16
568	PSB26M	CAP SCREW M6-1 X 12
571	PSS02M	SET SCREW M6-1 X 6
573	PSS34M	SET SCREW M5-.8 X 16
574	PSS29M	SET SCREW M6-1 X 35
575	PSS01M	SET SCREW M6-1 X 10
579	PRP03M	ROLL PIN 5 X 20
581	PRP45M	ROLL PIN 5 X 32
583	PRP41M	ROLL PIN 6 X 12
584	P9036584	BALL OILER 8MM
587	PN06M	HEX NUT M5-.8
588	PN01M	HEX NUT M6-1
596	P9036596	STEEL BALL 5MM
597	P9036597	SPACER
598	P9036598	PLUG



Apron Gear Train Breakdown



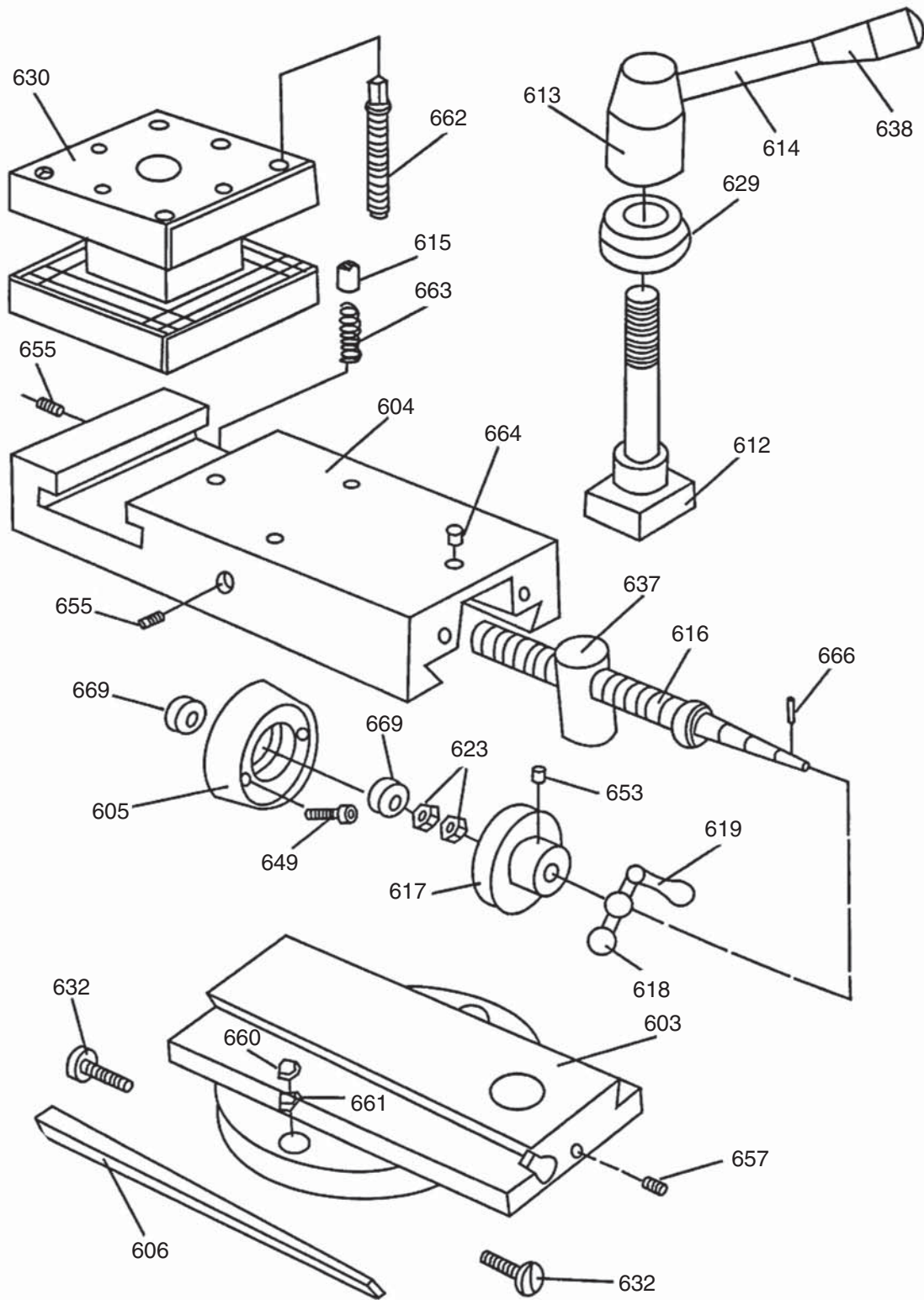
Apron Gear Train Parts List

REF	PART #	DESCRIPTION
502	P9036502	HANDWHEEL
505	P9036505	THREADING DIAL BODY
510	P9036510	INDEX RING
511	P9036511	COVER
512	P9036512	SHAFT
514	P9036514	GEAR SHAFT 13T
515	P9036515	GEAR
516	P9036516	SHAFT
517	P9036517	LOCK COLLAR
518	P9036518	GEAR 30T
519	P9036519	GEAR 46T
522	P9036522	GEAR 63T
523	P9036523	SHIFT FORK
526	P9036526	GEAR 40T
531	P9036531	BRASS GEAR 22T
532	P9036532	SHAFT
532A	PK10M	KEY 5 X 5 X 12
533	P9036533	GEAR 18T
534	P9036534	SHAFT

REF	PART #	DESCRIPTION
541	P9036541	SCREW
542	P9036542	SPACER
543	P9036543	SPACER
544	P9036544	SPACER
555	P9036555	PLUG B
556	P9036556	HANDLE
560	PSB33M	CAP SCREW M5-.8 X 12
564	PSB06M	CAP SCREW M6-1 X 25
569	PSB04M	CAP SCREW M6-1 X 10
570	PSS26M	SET SCREW M5-.8 X 6
572	PSS01M	SET SCREW M6-1 X 10
577	PSB26M	CAP SCREW M6-1 X 12
578	PRP16M	ROLL PIN 3 X 25
580	PRP05M	ROLL PIN 5 X 30
582	PRP49M	ROLL PIN 5 X 25
584	P9036584	BALL OILER 8MM
592	PORP015	O-RING 14.8 X 2.4 P15
595	PK14M	KEY 5 X 5 X 18



Compound Slide Breakdown



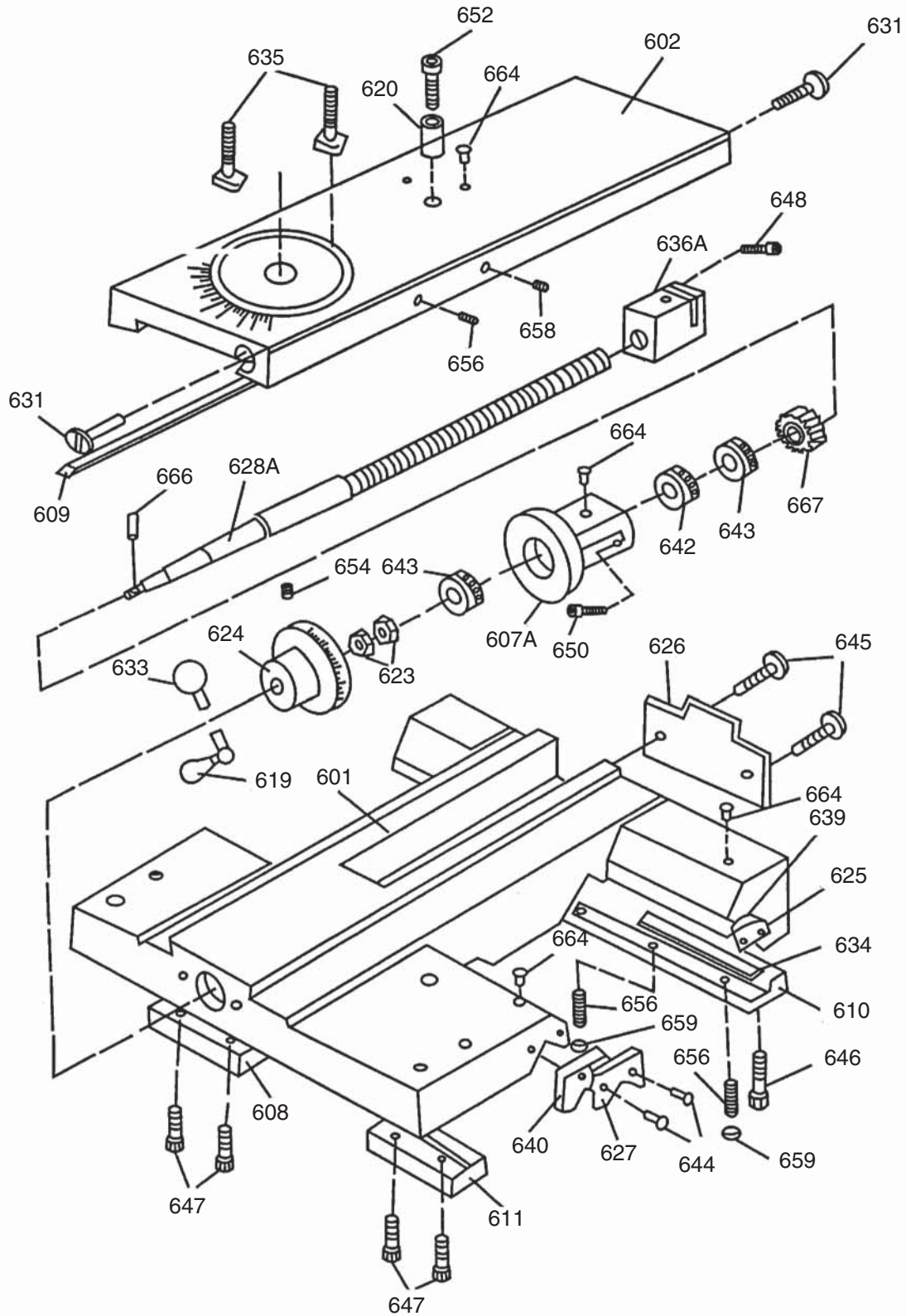
Compound Slide Parts List

REF	PART #	DESCRIPTION
603	P9036603	SWIVEL SLIDE
604	P9036604	TOP SLIDE
605	P9036605	COLLAR
606	P9036606	GIB
612	P9036612	SCREW
613	P9036613	HANDLE BASE
614	P9036614	HANDLE SHAFT
615	P9036615	STOP
616	P9036616	SCREW
617	P9036617	INDEX RING
618	P9036618	LEVER
619	P9036619	LEVER
623	P9036623	SPECIAL NUT M12-1
629	P9036629	WASHER
630	P9036630	POST BASE

REF	PART #	DESCRIPTION
632	P9036632	GIB ADJUSTING SCREW
637	P9036637	NUT
638	PSW03-1	KNOB
649	PSB02M	CAP SCREW M6-1 X 20
653	PSS02M	SET SCREW M6-1 X 6
655	PSS01M	SET SCREW M6-1 X 10
657	PSS20M	SET SCREW M8-1.25 X 8
660	PN03M	HEX NUT M8-1.25
661	PW01M	FLAT WASHER 8MM
662	P9036662	SCREW M10 X 40
663	P9036663	SPRING .6 X 4 X 18
664	P9036664	OIL BALL 8MM
666	PRP02M	ROLL PIN 3 X 16
669	P8101	THRUST BEARING 8101



Cross Slide Breakdown



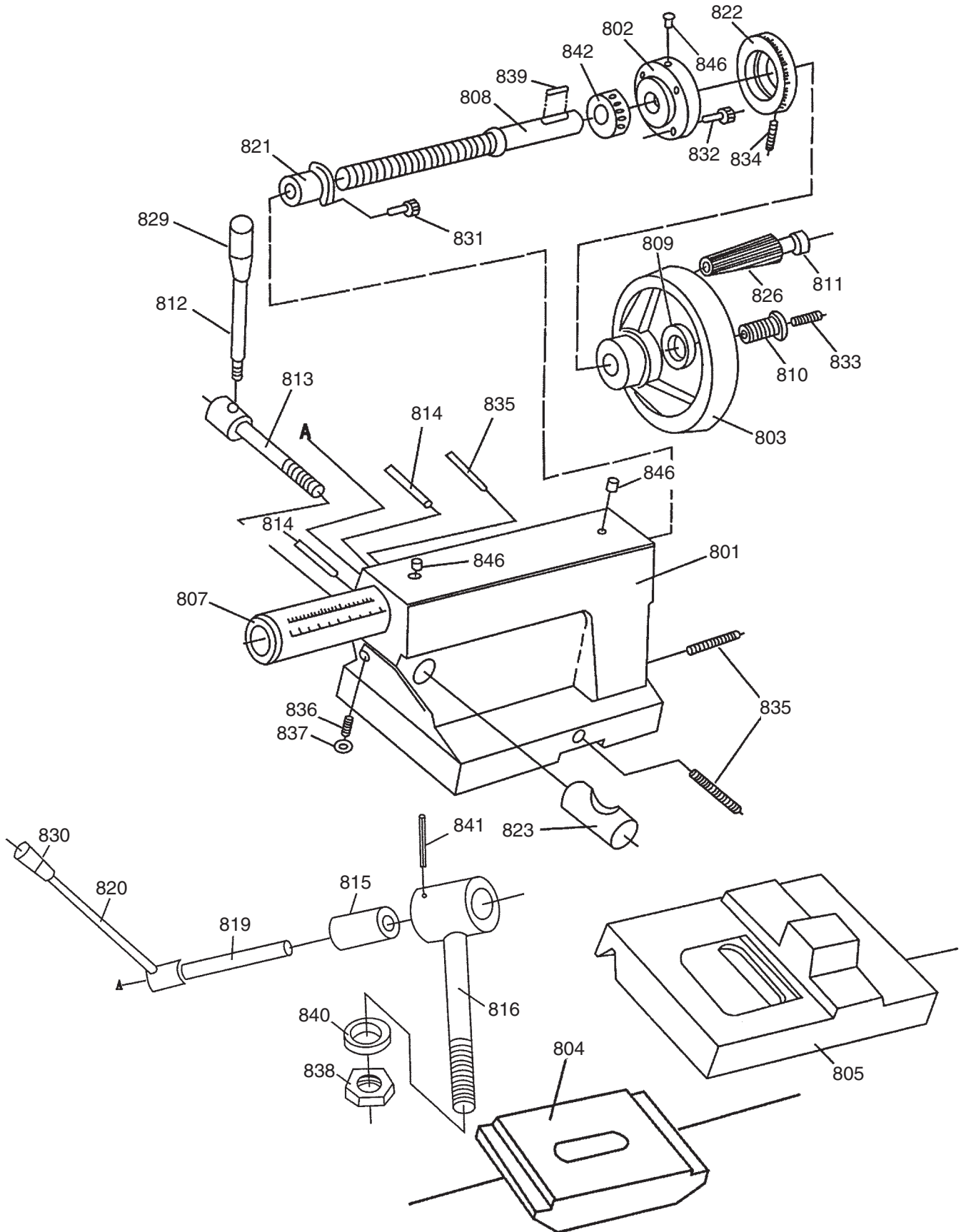
Cross Slide Parts List

REF	PART #	DESCRIPTION
601	P9036601	SADDLE
602	P9036602	CROSS SLIDE
607A	P9036607A	HUB V2.05.05
608	P9036608	STRIP
609	P9036609	GIB
610	P9036610	STRIP
611	P9036611	FRONT STRIP
619	P9036619	LEVER
620	P9036620	COLLAR
623	P9036623	SPECIAL NUT M12-1
624	P9036624	INDEX RING
625	P9036625	PLATE
626	P9036626	PLATE W/WIPER
627	P9036627	PLATE
628A	P9036628A	SCREW 10 PITCH V2.07.06
631	P9036631	GIB ADJUSTING SCREW
633	P9036633	LEVER
634	P9036634	GIB STRIP
635	P4016635	T-BOLT M8-1 X 42

REF	PART #	DESCRIPTION
636A	P9036636A	BLOCK 10 PITCH V2.07.06
639	P9036639	WIPER
640	P9036640	WIPER
642	P8101	THRUST BEARING 8101
643	P51102	THRUST BEARING 51102
644	PS02M	PHLP HD SCR M4-.7 X 12
645	PS76M	PHLP HD SCR M8-1.25 X 12
646	PB09M	HEX BOLT M8-1.25 X 20
647	PB09M	HEX BOLT M8-1.25 X 20
648	PSB01M	CAP SCREW M6-1 X 16
650	PSB06M	CAP SCREW M6-1 X 25
652	PSB11M	CAP SCREW M8-1.25 X 16
654	PSS03M	SET SCREW M6-1 X 8
656	PSS11M	SET SCREW M6-1 X 16
658	PSS16M	SET SCREW M8-1.25 X 10
659	PN01M	HEX NUT M6-1
664	P9036664	OIL BALL 8MM
666	PRP02M	ROLL PIN 3 X 16
667	P9036667	GEAR



Tailstock Breakdown



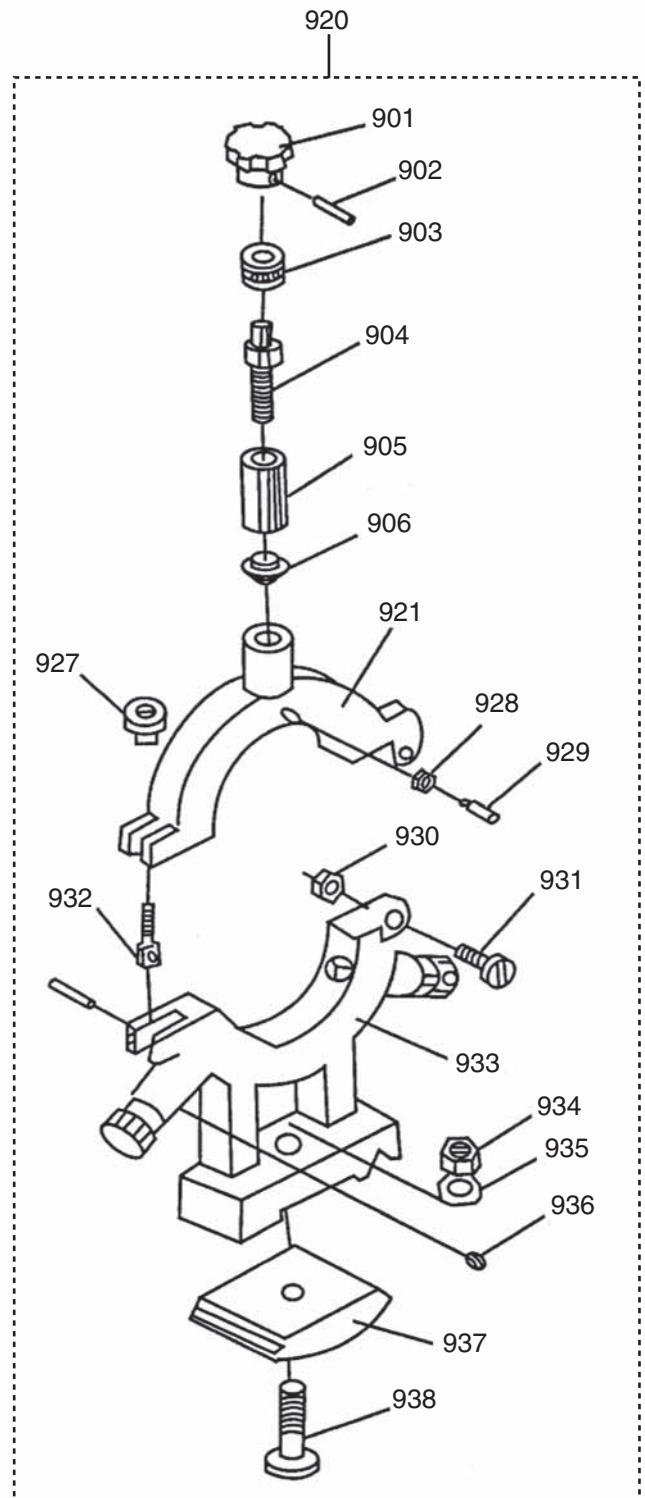
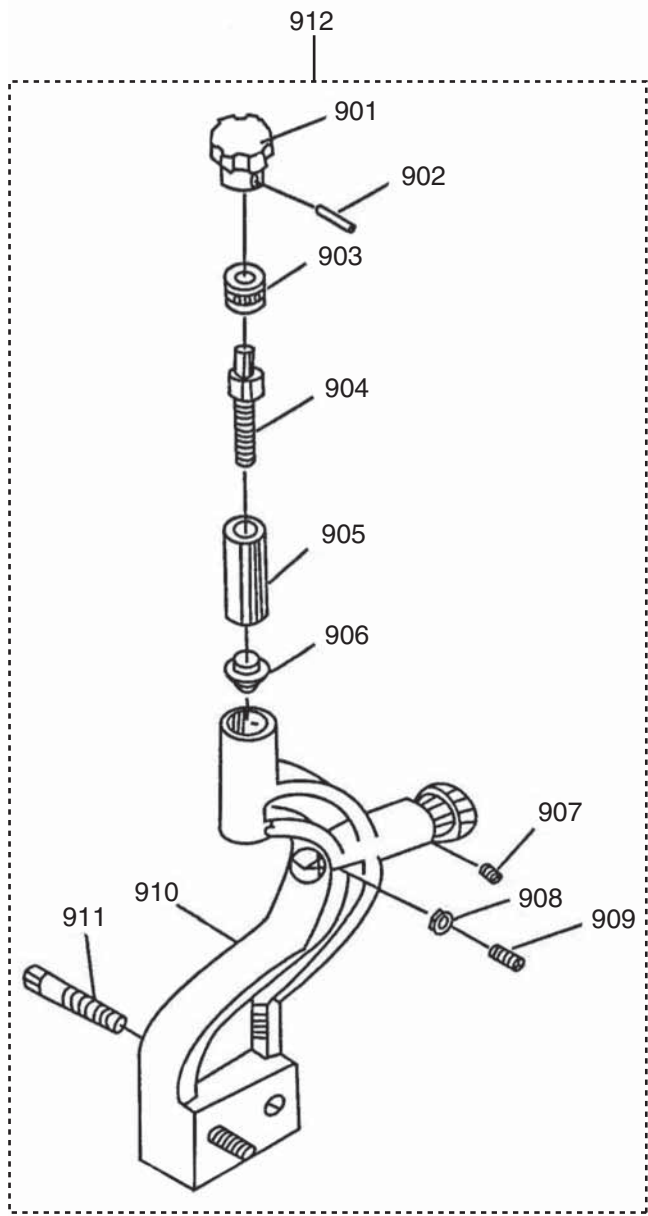
Tailstock Parts List

REF	PART #	DESCRIPTION
801	P9036801	CASTING
802	P9036802	FLANGE COVER
803	P9036803	HAND WHEEL
804	P9036804	CLAMP PLATE
805	P9036805	BASE
807	P90361007	QUILL
808	P9036808	SCREW
809	P9036809	WASHER
810	P9036810	SCREW
811	P9036541	SCREW
812	P90361012	SCREW
813	P9036813	SHAFT
814	P9036814	ADJUSTING SCREW
815	P90361015	COLLAR
816	P9036816	SCREW
819	P9036819	SHAFT
820	P90361020	LEVER
821	P9036821	NUT

REF	PART #	DESCRIPTION
822	P9036822	INDEXING RING
823	P90361023	PIVOT BLOCK
826	P9036556	HANDLE
829	PSW03-1	KNOB
830	P90361030	KNOB M10-1.5 X 50
831	PSB17M	CAP SCREW M4-.7 X 10
832	PSB01M	CAP SCREW M6-1 X 16
833	PSS24M	SET SCREW M5-.8 X 25
834	P9036834	SET SCREW
835	PSS86M	SET SCREW M10-1.5 X 45
836	P9036836	SCREW
837	PN03M	HEX NUT M8-1.25
838	PN09M	HEX NUT M12-1.75
839	P9036839	KEY
840	P90361040	WASHER
841	PRP06M	ROLL PIN 5 X 24
842	P51102	THRUST BEARING 51102
846	P9036846	BALL OILER 8MM



Follow & Steady Rests Breakdown



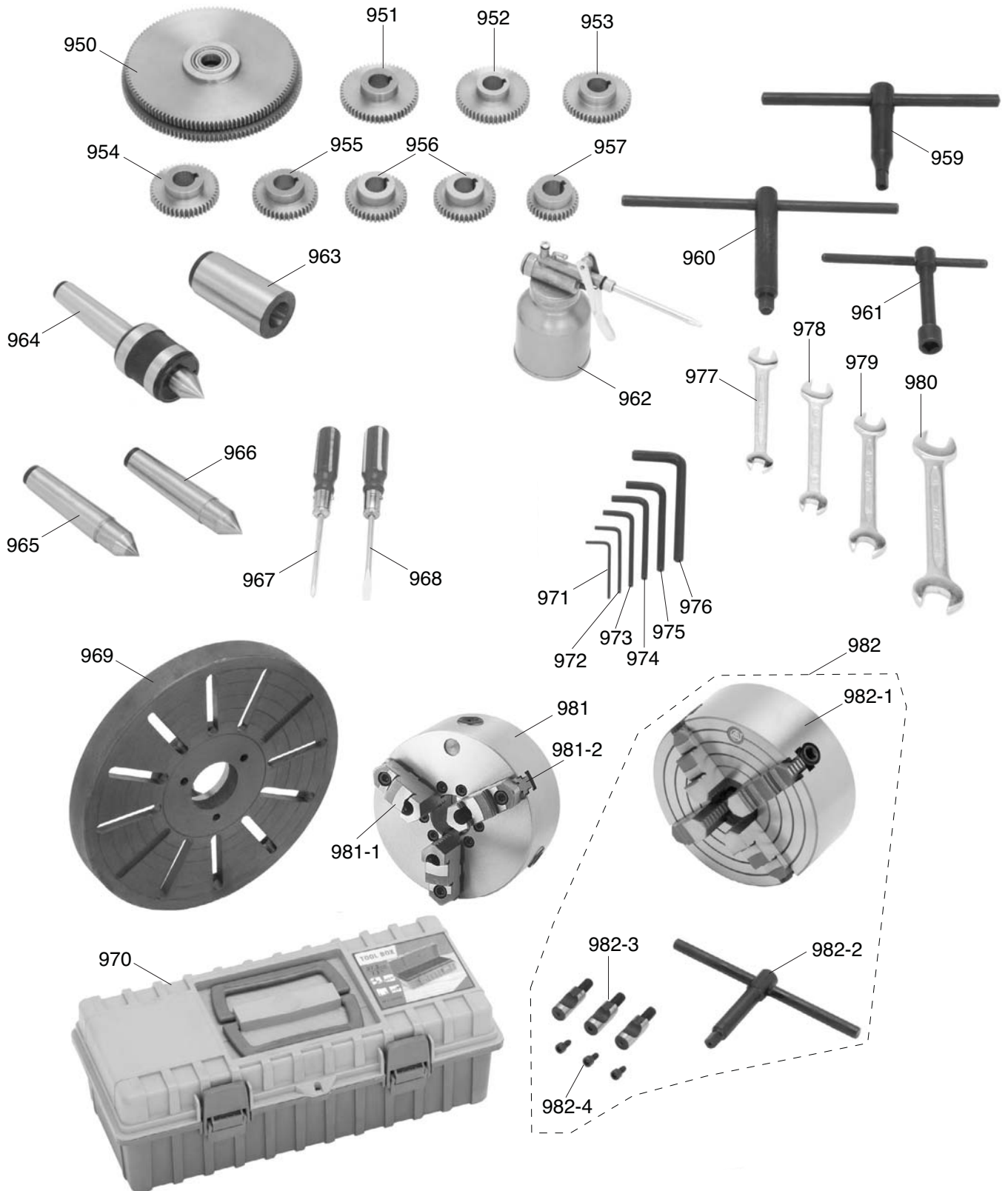
Follow & Steady Rests Parts List

REF	PART #	DESCRIPTION
901	PSW03-1	KNOB
902	PRP64M	ROLL PIN 3 X 18
903	P9036903	BUSHING
904	P9036904	SCREW
905	P9036905	SLEEVE
906	P9036906	BRASS FINGER
907	PSS02M	SET SCREW M6-1 X 6
908	PN01M	HEX NUT M6-1
909	PSS25M	SET SCREW M6-1 X 20
910	P9036907	BASE CASTING
911	PSB45M	CAP SCREW M8-1.25 X 45
912	P9036912	COMPLETE FOLLOW REST
920	P9036920	COMPLETE STEADY REST

REF	PART #	DESCRIPTION
921	P9036921	TOP CASTING
927	P9036927	LOCK KNOB
928	PN01M	HEX NUT M6-1
929	PSS25M	SET SCREW M6-1 X 20
930	PN01M	HEX NUT M6-1
931	PSB07M	CAP SCREW M6-1 X 30
932	P9036932	PIVOT BOLT
933	P9036933	BASE CASTING
934	PN09M	HEX NUT M12-1.75
935	PW06M	FLAT WASHER 12MM
936	PSS02M	SET SCREW M6-1 X 6
937	P9036937	CLAMP PAD
938	P9036938	CLAMP SCREW



Accessories Breakdown



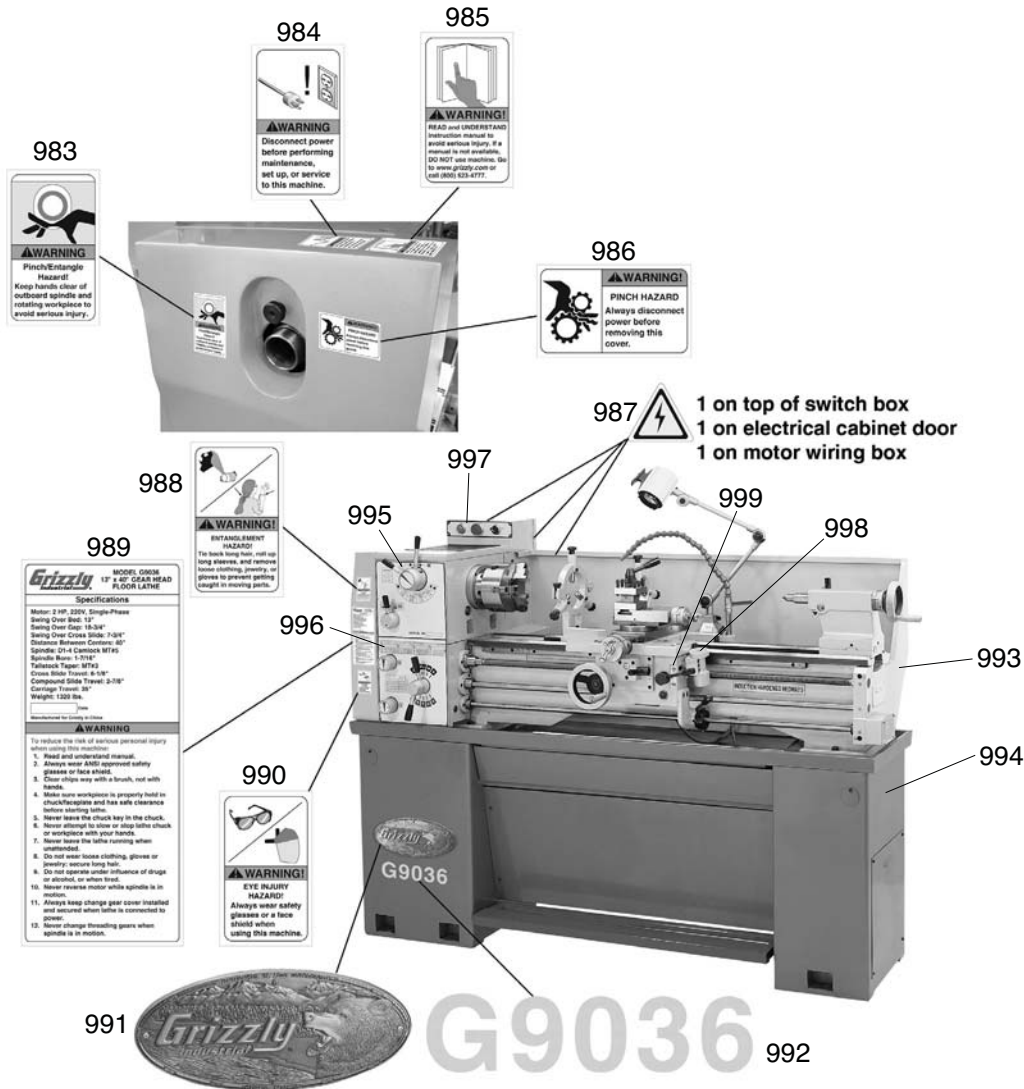
Accessories Parts List

REF	PART #	DESCRIPTION
950	P9036950	CHANGE GEAR 120/127T
951	P9036951	CHANGE GEAR 55T
952	P9036952	CHANGE GEAR 52T
953	P9036953	CHANGE GEAR 48T
954	P9036954	CHANGE GEAR 46T
955	P9036955	CHANGE GEAR 44T
956	P9036956	CHANGE GEAR 42T
957	P9036957	CHANGE GEAR 35T
959	P9036959	3-JAW CHUCK KEY
960	P9036960	CAM KEY
961	P9036961	TOOL POST WRENCH
962	P9036962	OIL CAN
963	P9036963	ADAPTER SLEEVE MT#5/3
964	P9036964	LIVE CENTER
965	P9036965	DEAD CENTER MT#3 CARBIDE TIP
966	P9036966	DEAD CENTER MT#3 HSS TIP
967	P9036967	PHILLIPS SCREWDRIVER
968	P9036968	FLAT HD SCREWDRIVER
969	P9036969	FACEPLATE 12"

REF	PART #	DESCRIPTION
970	P9036970	TOOLBOX
971	PAW02.5M	HEX WRENCH 2.5MM
972	PAW03M	HEX WRENCH 3MM
973	PAW04M	HEX WRENCH 4MM
974	PAW05M	HEX WRENCH 5MM
975	PAW06M	HEX WRENCH 6MM
976	PAW08M	HEX WRENCH 8MM
977	PWR1012	WRENCH 10/12MM
978	PWR911	WRENCH 9/11MM
979	PWR1214	WRENCH 12/14MM
980	PWR1719	WRENCH 17 X 19
981	P9036981	3-JAW CHUCK W/JAWS
981-1	P9036981-1	REVERSIBLE TOP JAW
981-2	P9036981-2	STD JAWS FOR 3-JAW CHUCK
982	P9036982	4-JAW CHUCK KIT
982-1	P9036982-1	4-JAW CHUCK W/JAWS
982-2	P9036982-2	4-JAW CHUCK KEY
982-3	P9036982-3	CAM-LOCK STUD
982-4	P9036982-4	CAM STUD SCREW



Labels Breakdown



REF	PART #	DESCRIPTION
983	P9036983	OUTBOARD ENTANGLE LABEL
984	P9036984	DISCONNECT 220V LABEL
985	P9036985	READ MANUAL LABEL
986	P9036986	GEAR PINCH LABEL
987	PLABEL-14	ELECTRICITY LABEL
988	P9036988	ENTANGLEMENT LABEL
989	P9036989	G9036 MACHINE ID LABEL
990	P9036990	GLASSES/FACE SHEILD LABEL
991	G8588	GRIZZLY NAMEPLATE

REF	PART #	DESCRIPTION
992	P9036992	G9036 MODEL # LABEL
993	PPAINT-11	"PUTTY" TOUCH-UP PAINT
994	PPAINT-1	"GRIZZLY GREEN" TOUCH-UP PAINT
995	P9036995	HEADSTOCK FACE PLATE
996	P9036996	GEARBOX FACE PLATE
997	P9036997	CONTROL PANEL FACE PLATE
998	P9036998	THREAD DIAL SCALE
999	P9036999	HALF-NUT ENGAGE LABEL

WARNING

Safety labels warn about machine hazards and ways to prevent injury. The owner of this machine **MUST** maintain the original location and readability of the labels on the machine. If any label is removed or becomes unreadable, **REPLACE** that label before using the machine again. Contact Grizzly at (800) 523-4777 or www.grizzly.com to order new labels.



Grizzly **WARRANTY CARD**
Industrial, Inc.

Name _____
 Street _____
 City _____ State _____ Zip _____
 Phone # _____ Email _____ Invoice # _____
 Model # _____ Order # _____ Serial # _____

The following information is given on a voluntary basis. It will be used for marketing purposes to help us develop better products and services. **Of course, all information is strictly confidential.**

1. How did you learn about us?

<input type="checkbox"/> Advertisement	<input type="checkbox"/> Friend	<input type="checkbox"/> Catalog
<input type="checkbox"/> Card Deck	<input type="checkbox"/> Website	<input type="checkbox"/> Other:

2. Which of the following magazines do you subscribe to?

<input type="checkbox"/> Cabinet Maker	<input type="checkbox"/> Popular Mechanics	<input type="checkbox"/> Today's Homeowner
<input type="checkbox"/> Family Handyman	<input type="checkbox"/> Popular Science	<input type="checkbox"/> Wood
<input type="checkbox"/> Hand Loader	<input type="checkbox"/> Popular Woodworking	<input type="checkbox"/> Wooden Boat
<input type="checkbox"/> Handy	<input type="checkbox"/> Practical Homeowner	<input type="checkbox"/> Woodshop News
<input type="checkbox"/> Home Shop Machinist	<input type="checkbox"/> Precision Shooter	<input type="checkbox"/> Woodsmith
<input type="checkbox"/> Journal of Light Cont.	<input type="checkbox"/> Projects in Metal	<input type="checkbox"/> Woodwork
<input type="checkbox"/> Live Steam	<input type="checkbox"/> RC Modeler	<input type="checkbox"/> Woodworker West
<input type="checkbox"/> Model Airplane News	<input type="checkbox"/> Rifle	<input type="checkbox"/> Woodworker's Journal
<input type="checkbox"/> Modeltec	<input type="checkbox"/> Shop Notes	<input type="checkbox"/> Other:
<input type="checkbox"/> Old House Journal	<input type="checkbox"/> Shotgun News	

3. What is your annual household income?

<input type="checkbox"/> \$20,000-\$29,000	<input type="checkbox"/> \$30,000-\$39,000	<input type="checkbox"/> \$40,000-\$49,000
<input type="checkbox"/> \$50,000-\$59,000	<input type="checkbox"/> \$60,000-\$69,000	<input type="checkbox"/> \$70,000+

4. What is your age group?

<input type="checkbox"/> 20-29	<input type="checkbox"/> 30-39	<input type="checkbox"/> 40-49
<input type="checkbox"/> 50-59	<input type="checkbox"/> 60-69	<input type="checkbox"/> 70+

5. How long have you been a woodworker/metalworker?

<input type="checkbox"/> 0-2 Years	<input type="checkbox"/> 2-8 Years	<input type="checkbox"/> 8-20 Years	<input type="checkbox"/> 20+ Years
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6. How many of your machines or tools are Grizzly?

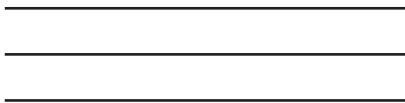
<input type="checkbox"/> 0-2	<input type="checkbox"/> 3-5	<input type="checkbox"/> 6-9	<input type="checkbox"/> 10+
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7. Do you think your machine represents a good value? Yes No
8. Would you recommend Grizzly Industrial to a friend? Yes No
9. Would you allow us to use your name as a reference for Grizzly customers in your area?
Note: We never use names more than 3 times. Yes No

10. Comments: _____

CUT ALONG DOTTED LINE

FOLD ALONG DOTTED LINE



Place
Stamp
Here



GRIZZLY INDUSTRIAL, INC.
P.O. BOX 2069
BELLINGHAM, WA 98227-2069



FOLD ALONG DOTTED LINE

Send a Grizzly Catalog to a friend:

Name	_____
Street	_____
City	_____ State _____ Zip _____

TAPE ALONG EDGES--PLEASE DO NOT STAPLE

WARRANTY AND RETURNS

Grizzly Industrial, Inc. warrants every product it sells for a period of **1 year** to the original purchaser from the date of purchase. This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence, accidents, repairs or alterations or lack of maintenance. This is Grizzly's sole written warranty and any and all warranties that may be implied by law, including any merchantability or fitness, for any particular purpose, are hereby limited to the duration of this written warranty. We do not warrant or represent that the merchandise complies with the provisions of any law or acts unless the manufacturer so warrants. In no event shall Grizzly's liability under this warranty exceed the purchase price paid for the product and any legal actions brought against Grizzly shall be tried in the State of Washington, County of Whatcom.

We shall in no event be liable for death, injuries to persons or property or for incidental, contingent, special, or consequential damages arising from the use of our products.

To take advantage of this warranty, contact us by mail or phone and give us all the details. We will then issue you a "Return Number," which must be clearly posted on the outside as well as the inside of the carton. We will not accept any item back without this number. Proof of purchase must accompany the merchandise.

The manufacturers reserve the right to change specifications at any time because they constantly strive to achieve better quality equipment. We make every effort to ensure that our products meet high quality and durability standards and we hope you never need to use this warranty.

Please feel free to write or call us if you have any questions about the machine or the manual.

Thank you again for your business and continued support. We hope to serve you again soon.



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